CORRES CONTROL
OUTGOING LTR NO
98-RF-01028

DIST	LTR	ENC
Bacon, Roger	X	
Benaussen, Stan		
Bormolini, Ann		
Brailsford, Marvin		
Burdge, Larry		
Card, Bob		
Cosgrove, Mike		
Crawford, Clegg	X	
Harding, Wynn		
Herring, Chuck		
Hill, John		
Martinez, Len	X	
Parker, Alan	X	
Tiller, Robert		
Tuor, Nancy		
Voorhels, Gary	X	
Pizzuto, V	X	X
Tasset, G	X	
Schumaker L	X	
Glanti, S	X	
North, K	X	X
Shelton, D	X	
Kassen, M	X	
Korenko M	X	
Hamrick, D	X	X
Miller S	X	X
CORRES CONTROL	X	X
ADMIN RECORD/680		
TRAFFIC		
PATS/T130G	X	X

CLASSIFICATION:		
UCNI		
UNCLASSIFIED	X	X
CONFIDENTIAL		
SECRET		

AUTHORIZED CLASSIFIER SIGNATURE

DATE 2-27-98

[redacted]

ACTION ITEM STATUS

___ PARTIAL/OPEN

[redacted]

LTR APPROVALS

ORIG & TYPIST

JGM gjh

KAISER•HILL COMPANY

February 27, 1998 98-RF-01028

Gary Schuetz
Nuclear Material Safeguards
DOE, RFFO

BUILDING 771 DECOMMISSIONING OPERATIONS PLAN - JGM-009-98

A milestone in Work Authorization Document (WAD) 34, 771/774 Cluster Project, Work Breakdown Structure (WBS) Element 1 1 06 10 03, is to deliver the Decommissioning Operations Plan (DOP) to the Department of Energy, Rocky Flats Field Office (DOE/RFFO) by March 1, 1998 As part of this milestone, a Reconnaissance Level Characterization Report was delivered to DOE/RFFO on December 17, 1997, and a draft version of the DOP was delivered on January 28, 1998

Attached is the Building 771 DOP DOE/RFFO comments on the January 28th draft document were received on February 13, 1998 These comments have been dispositioned as reported in our meeting of February 23, 1998

Kaiser Hill Company, L.L.C considers that we met the criteria to deliver the DOP by March 1, 1998 If you have any questions, please contact me at Extension 4827

Greg Meyer
Deputy Director, 771/774 Closure Project
Nuclear Operations
Kaiser-Hill Company, L L C

gjh

Orig and 1 cc - Gary Schuetz

Attachment
As Stated

cc
Fred Gerdeman - DOE,RFFO
John Rampe - DOE,RFFO

Kaiser-Hill Company, L L C
Courier Address Rocky Flats Environmental Technology Site, State Hwy 93 and Cactus, Rocky Flats, CO 80007 • 303 966 7000
Mailing Address P O Box 464, Golden, Colorado 80402 0464

Bldg. 771/774 Closure Project

Decommissioning Operations Plan

Revision 0

February 27, 1998

Building 771/774 Closure Project

Decommissioning Operations Plan

Revision 0

Approvals

Prepared By: _____ / 2/27/98

S B. Miller **Date**

771/774 Closure Project

Approved By: _____ / 2/27/98

D. G. Hamrick **Date**

771/774 Closure Project Manager

Reviewed By: _____ / 2/27/98

J. G. Meyer **Date**

Deputy Director 771/774 Closure Project

Approved By: _____ 2/27/98

V. M. Pizzuto **Date**

Director 771/774 Closure Project

Approved By: _____ /

Department of Energy **Date**

Approved By: _____ /

CO Dept of Public Health & Environment **Date**

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Tables & Figures

Executive Summary

The end of the Cold War moved the Department of Energy's focus from nuclear weapons production to the stabilization and cleanup of previously operating facilities Many production facilities that once operated with a high priority, are now considered surplus or excess Rocky Flats Environmental Technology Site (RFETS), which was significantly impacted by this transition of DOE missions, has embarked on the process of planning the closure of a major nuclear facility This document describes the closure process for Building 771/774 and 771 clusters and its associated buildings Hereafter this project will be referred to as the "771/774 Closure Project"

Building 771 was used for processing plutonium and actinides with a wide variety of processes between 1951 and 1989 This included many modifications, a substantial variation in operations, and several upsets resulting in radiological contamination of the facility The Plutonium Vulnerability Study determined Building 771 to be the "most dangerous building in America " Since that time, a significant quantity of Special Nuclear Material (SNM) has been removed, lowering the risks involved Now, RFETS is undertaking the ambitious task of planning a monumental closure project, which will safely and cost-effectively deactivate, decontaminate and decommission the clusters

With the end of production at RFETS, the 771/774 Closure Project has no further use Both "No Action" and "reuse" alternatives were considered for the area after deactivation However, it was determined that the clusters should be removed for the following reasons 1) due to the age of the clusters, as well as the radiological contamination levels, it is more economical to remove the clusters rather than renovate them for some undefined future use, 2) removal of the clusters will allow for remediation of the soil beneath, and 3) removal of the clusters will allow for a significant reduction of risk at RFETS

The overall long-term Strategic End Points for the Building 771/774 Closure Project are

- The building is emptied and removed, leaving the slab in place Protection will be provided to minimize migration of remaining radiological contamination
- Characterization of the remaining materials and characteristics will be documented to support a monitoring program and future environmental remediation
- A monitoring plan will be written in cooperation with those who will assume management responsibility for monitoring and remediation

Unlike previous efforts towards closure of nuclear facilities, the 771/774 Closure Project utilizes a phased approach This approach moves away from the typical "deactivation, decontamination, and decommissioning" in series and moves towards a well-integrated parallel approach where all three of these activities may occur at any time within the facility The six phases are shown below

Phase I	-	Major Hazard Reduction	• Phase IV	-	Utility System Shutdown
Phase II	-	Equipment Dismantlement	• Phase V	-	Building Demolition
Phase III	-	Building Decontamination	• Phase VI	-	Site Remediation

This phased approach enables Building 771 to begin closure in a number of areas, allowing for the most efficient utilization of resources It also accelerates closure schedules for the clusters This will eliminate the costs associated with the surveillance and maintenance of these clusters allowing these costs to be reallocated towards other risk-reduction activities at RFETS Throughout this approach, a number of strategies will be employed, including Environmental, Health & Safety, Waste Management, and Quality Assurance By following these strategies, as well as a set of guiding principles, RFETS intends to close the 771/771 clusters as expeditiously as possible, in a safe, cost-effective manner

In many cases, this document is a "road map," pointing the reader to existing documentation, and processes that are implemented on site Also, methodologies are provided rather than explicit decisions In undertaking such a large task, there will be cases where circumstances are not as were predicted Therefore, this document details the decision process that will be utilized throughout the project

The closure process for these clusters has already begun with initial hazard reduction activities The completion date (~2005) is projected from the schedule and budget in conjunction with the Closure Project Baseline Currently, activities are underway to develop logic tied, resource-loaded schedules for the closure of Building 771 and its associated facilities It is expected that this effort will result in a significantly accelerated project completion date, which will be incorporated into the Closure Project Baseline

Wastes resulting from this activity will be managed in accordance with all applicable Federal, State, and local requirements Packaging of radiological waste will follow Rocky Flats procedures as specified in the 771 Closure Waste Management Plan An estimated 870,000 ft^3 of Low Level Waste, 2,200 ft^3 of Low Level Mixed waste, and 61,000 ft^3 of TRU waste are expected to be generated as a result of this project

All wastes will be sent to the appropriate off-site storage or disposal facility such as Envirocare, Nevada Test Site (NTS), or the Waste Isolation Pilot Plant (WIPP)

The 771/774 Closure Project will result in a significant reduction of risk at RFETS Furthermore, closure will eliminate the costs associated with the surveillance and maintenance of these clusters allowing these savings to be reallocated towards other risk-reduction activities at RFETS

1. Introduction

This Building 771/774 Closure Project Decommissioning Operations Plan (DOP) specifies the overall requirements to achieve the project's objectives and describes how the project is to be conducted The purpose of the Closure Project DOP is to communicate the objectives, requirements, and constraints to the project participants/stakeholders, as well as document for the Department of Energy and regulators how the project is to be conducted

This document has been written to focus on the Building 771/774 Closure Project and to minimize repetition of information and instructions elsewhere Readers who need general background on Rocky Flats should consult programmatic documentation (e g , Accelerating Cleanup Focus 2006, Closure Project Baseline, etc)

This Decommissioning Operations Plan fulfills the intent of

- Deactivation/closure plans, per DOE Order 430 1-1
- Work Summary Plan (WSP)
- Decommissioning Operations Plan (DOP), as required by the Rocky Flats Cleanup Agreement (RFCA)

1.1 Background

The end of the Cold War moved the Department of Energy's focus from nuclear weapons production to the stabilization and cleanup of previously operating facilities Many production facilities that once operated with a high priority, are now considered surplus or excess. Of the over 700 facilities identified at RFETS, eight are contaminated with plutonium, twelve are contaminated with both uranium and plutonium, thirty-four have minor radiological contamination and the remainder have no known history of radiological contamination Many of these facilities were used to conduct production operations while others were ancillary facilities used for storage, administration, and support services

Building 771 was used for processing plutonium and actinides with a wide variety of processes between 1951 and 1989 This included many modifications, a substantial variation in operations, and several upsets resulting in radiological contamination of the facility References found in Appendix 1 provide historical details of the building through 1992 as well as a comprehensive summary of the current status of the building and its contents as a result of a walkdown conducted in 1996

1.2 "Contractor Blind" Approach

This Closure Decommissioning Operations Plan details what is required to accomplish the project, regardless of which contractor organization will have management responsibility for conduct of various project tasks Once the project's tasks are defined, decisions as to which organization will have responsibility will be determined Roles and responsibilities are detailed in Section 4 2

2. Building/Cluster Description

The 771/774 Closure Project scope includes the deactivation, decontamination, and decommissioning of Building 771/774 and the ancillary support structures, including trailers, plant systems and utilities, underground tank systems, and waste sites These areas are referred to as the 771 and 771A Clusters in the Closure Project Baseline Removal of the foundation and underground utilities (including process waste system pipes and ancillary underground equipment), as well as remediation of soil contamination will be completed during the subsequent environmental remediation phase, not included as part of this project

The location of each building/facility is shown graphically in Figure 2-1 A complete list of these buildings with a brief description is shown in Table 2-1 A complete list of systems involved in this project is shown in Table 2-2

Table 2-1 Buildings and Structures

Identifier #	Description of Building/Facility
262	Diesel fuel tank
714/714A	Hydrofluoric (HF) storage (operationally empty)
714B	Emergency Breathing Air
715	Emergency generator #1
716	Emergency generator #2
717	Magnahelic Gauge Building
728	Process waste pit / underground storage tank (No underground work)
770	Maintenance and offices
771	Former Plutonium Recovery Facility
771B	Carpenter shop
771C	Nuclear waste packing/drum counting (Annex)
772/772A	Fluorine/acid storage bldg
773	Guard post
774	Pu waste treatment facility
775	Sanitary lift station
N/A	Exhaust Stack
T771A-H & J- L	Various trailers
771A	Corridor F Office Area

Table 2-2 771 Facility Systems

Ambient air particulate samplers
Breathing Air
Building chemical/gas support (HF, Ar, F, N_2, O_2, NaOH, KOH, Propane)
Continuous Air Monitoring
Criticality Alarm System
Domestic water (hot and cold)
Electrical distribution
Emergency Diesel Generators and Diesel Fuel Oil (no underground work)
Eye wash and safety showers
Fire detection (Glovebox Overheat, plenum deluge, Contamination control (CC) cell, risers, fire phones, and pull stations)
Fire suppression (sprinklers, dry chemical, plenum deluge, hose stations, mains, and hydrants)
Footing
Grounding and lightning protection
Health-physics vacuum system
Heating, Ventilation, and Air Conditioning (HVAC) Zones I, IA, II, III, IV
Inert Systems (Nitrogen, Argon) with oxygen analyzers
Instrument Air
Life Safety/Disaster Warning System
Natural gas
Plant Air
Process chilled water
Process cooling water
Process waste
Roof Drains
Sanitary waste
Security System (door and vault alarms, video monitors)
Steam and condensate
Tank purging and venting system
Telecommunication/Local Area Network
Uninterruptible power supply (UPS)
Vacuum transfer system

2.1 Interfaces

2.1 1 System Interfaces

A number of systems are interconnected between Building 771/774 and other facilities on site These systems are listed below Consideration for the interfaces will be given as closure is planned for each portion, and actions will be taken to prevent unexpected disruption of services

- Electrical - connected to the 515/516 Substation
- Nitrogen - connected to the Nitrogen plant
- Argon Tank - connected to a tank outside the facility
- Plant Air - received from Building 776
- Breathing Air - received from Building 707/708
- Criticality System - connected to the plant-wide system
- Water - received from Building 124
- Steam - received from Building 443
- Sanitary Sewer - connected to the plant-wide system
- Liquid Process Waste - connected to the plant-wide system
- Natural Gas - connected to the plant-wide system
- Telephone System - connected to the plant-wide system
- Fire Protection Systems - connected to the plant-wide system
- Security Protection Systems - connected to the plant-wide system

2 1.2 Physical Interfaces

There are three tunnels that connect Building 771/774 to other structures

- 267 ft tunnel connects Building 771 to Building 776 for purposes of moving materials
- 170 ft utility tunnel connects Building 771 to Building 774
- 140 ft exhaust duct tunnel connects Building 771 to the exhaust stack

The grounding/lightning system is interconnected between Building 771, Building 715, and Building 774

The underground tunnels and utilities associated with the 771/774 Closure Project are not within the scope of this closure project These items will be capped and left in place

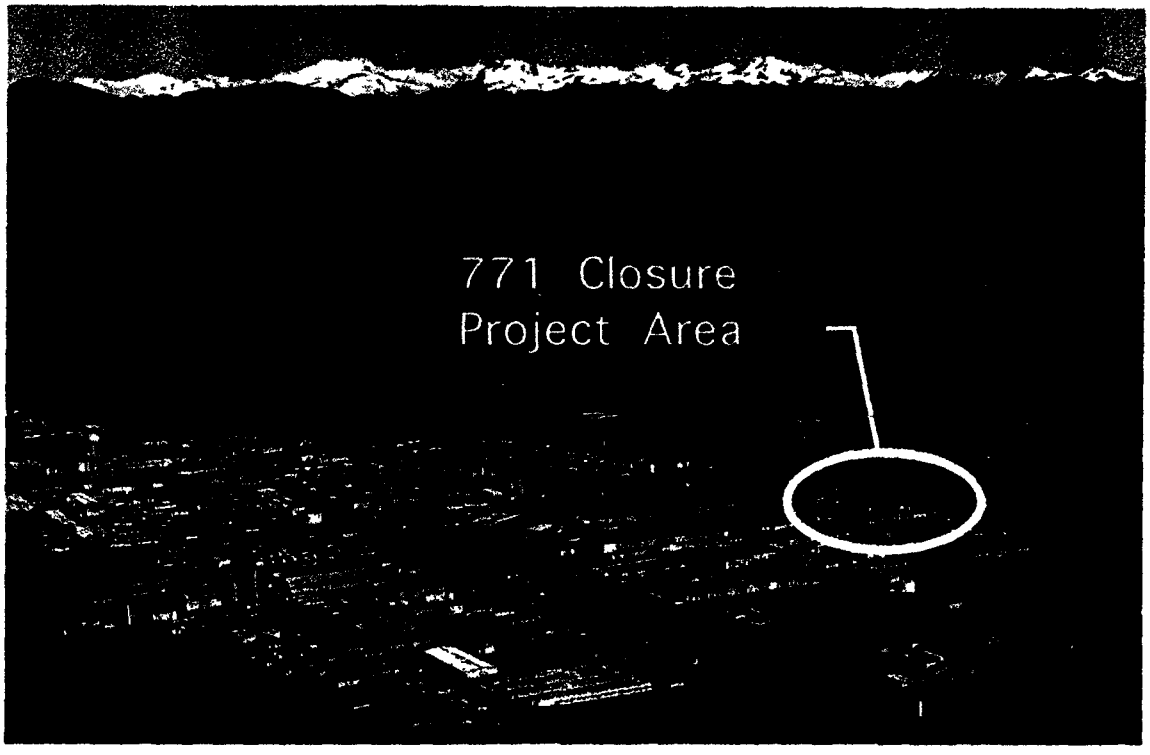


Figure 2-1 Rocky Flats Environmental Technology Site

Figure 2-2 771/774 Closure Project Facilities

3. Alternative Analysis and Selection

Several alternatives were considered for the near-term management of the 771/774 Closure Project The preamble to RFCA and the RFETS vision statement both contain the objective that buildings will be decontaminated as required for future use or demolition The evaluation of the scope of work for the 771/774 Closure Project considered the following three alternatives

- Alternative 1 - Decontamination/Decommissioning of the 771/774 Closure Project facilities
- Alternative 2 - No Action with Safe Shutdown Maintenance
- Alternative 3 - Reuse of the 771/774 Closure Project facilities

The alternatives were evaluated for effectiveness, implementability and relative costs The results of the alternative analysis are summarized in Table 3-1 Alternative 1 is the selected alternative Decontamination and decommissioning of the 771/774 Closure Project facilities clearly supports the RFETS vision of safe, accelerated, and cost-effective closure This alternative has the lowest life-cycle costs, the fastest risk reduction and is integrated with the operations of the site This alternative also maintains long-term protection of public health and the environment Short-term impacts to the environment (i e , impacts during the duration of the action) can be physically and administratively controlled There are no significant negative aspects to decontamination and decommissioning of the clusters at this time A full discussion of the impacts is provided in Section 8

Alternative 2, No Action with Safe Shutdown Maintenance, does not immediately achieve RFETS goals The alternative does not accomplish accelerated closure and defers decontamination and decommissioning This results in an increase in the life-cycle cost of closure The short-term protection of public health and the environment is achieved by inaction However, this protection decreases over time, due to continued degradation of systems and equipment through aging Furthermore, waste and debris requiring treatment and/or disposal, and the risks associated with managing them, are not eliminated from the clusters under this alternative

Alternative 3, Reuse, is not feasible as evidenced in evaluations that indicated that reuse of the 771/774 Closure Project facilities is neither required nor beneficial Furthermore, as with Alternative 2, implementation of this action will result in the deferral, not elimination, of eventual decontamination and decommissioning necessary for final closure

Table 3-1 Alternative Analysis Summary

Alternative	Description	Effectiveness	Implementation Feasibility	Relative Cost
1- D&D	Decontamination and Decommissioning (D&D) activities will follow area-specific plans approved by the DOE and CDPHE Activities consist of decontamination as deemed necessary, and decommissioning to include dismantlement and demolition	D&D is effective in achieving the long-term goals of RFCA The mortgage costs are eliminated and the risks and hazards are significantly reduced	Technology currently exists to achieve the objectives of this alternative Integration with other site activities can be accomplished	Immediate D&D has the lowest life-cycle costs since the cluster must eventually incur these costs as part of its baseline Once closure is achieved, minimal landlord costs are incurred
2 - No Action	No action will maintain the 771/774 Closure Project in its current configuration No additional equipment would be removed unless the present safe shutdown status of the clusters becomes compromised	No Action delays the closure activities that must eventually be performed to meet the goals of RFCA Deferring the closure could make funding available to other site closure activities Long term goals could be jeopardized if the integrity of the mothballed facilities increases risk to workers and the environment	No Action would cause a disruption to the long-term plans for RFETS, and is not ideally implementable since the closure of these clusters is planned to occur early in the site closure process	No Action results in higher costs than immediate D&D since landlord costs would continue to be incurred until D&D begins
3 - Reuse	Reuse of the 771 Cluster would keep the facilities in their current configuration A new mission for the facilities, in support of the present site Cleanup Mission, would be assigned by the site Utilization Review Board Depending on the nature of the new mission, additional removal of equipment may be necessary The current utilities and equipment would be maintained until a new mission was defined	Reuse of the 771/774 Closure Project was evaluated by the Sites Facility Use Committee and it was determined that there was no further mission for the cluster Use of the cluster for an alternative off-site use was evaluated in accordance with DOE Order 4300/ 1C, Subparagraph g, Disposal of Government -Owned Land Improvements No further use was identified	Because no new mission has been identified for the cluster, and because the closure of these clusters is identified through the Life-Cycle baseline to begin soon, implementation of this alternative is not administratively feasible	This alternative would result in the greatest life-cycle costs as the reuse mission would more than likely require expenditures for modifications to the buildings in addition to existing landlord/ surveillance costs Furthermore, D&D costs (adjusted for future value) would still be required

4. Project Approach

A number of strategies were used in the development of the 771/774 Closure Project scope, work logic, schedule performance, basis of estimates and costs The major strategies employed in the Rocky Flats' 771/774 Closure Project are the same as those employed by the Site's Ten Year Plan, "Accelerated Cleanup Focus on 2006"

- Maintain the site's safety envelope ensuring the continued safety of site workers, the public, and the environment during cleanup activities
- Eliminate highest priority risks first High priority risk activities primarily involve stabilization, consolidation, interim storage, and offsite shipment of SNM
- Reduce the site's high nuclear facility baseline costs by accelerating closure of these facilities through expedited stabilization and removal of SNM
- Demolish site facilities and infrastructure to eliminate future funding and safety liabilities, ongoing maintenance and surveillance, and residual radioactive material management
- Clean up environmentally contaminated areas to the extent that sources of contamination that pose a significant risk are mitigated and controlled Site cleanup is performed to the extent necessary to support the land uses described in RFCA and to ensure that downstream water quality standards are met
- Reduce infrastructure and management costs at a steady pace throughout the life of the cleanup project
- Comply with all applicable laws, regulations, and agreements

4.1 Strategic Project Phases

The overall long-term Strategic End Points for the 771/774 Closure Project consist of the following

- The building is emptied and removed, leaving the slab in place Protection will be provided to minimize migration of remaining radiological contamination
- Characterization of the remaining materials and characteristics will be documented to support a monitoring program and future remediation
- A monitoring plan will be written in cooperation with those who will assume management responsibility for monitoring and remediation The monitoring plan will be consistent with the site's Integrated Monitoring Plan, and the Industrial Area IM/IRA

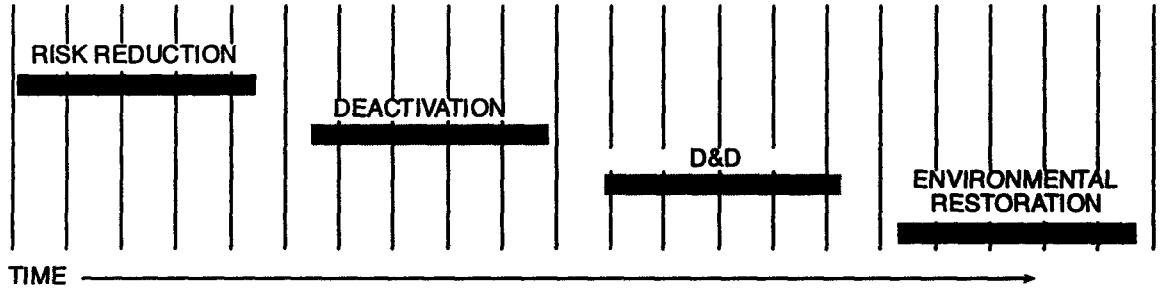
4 1 1 Integrated Approach to Closure

The 771/774 Closure Project supports the DOE Strategic plan by closing a major nuclear facility at Rocky Flats This project is also a necessary component of the Focus 2006 plan, as it is essential to the full closure of Rocky Flats Planning for this project has been included in the Life Cycle Baseline which

governs the interface of multiple projects and programs This project is included as part of the overall Rocky Flats Closure Project

Unlike previous efforts towards closure of nuclear facilities, the 771/774 Closure Project utilizes a new approach to closure This approach moves away from the typical "deactivation, decontamination, and decommissioning" in series and moves towards a well-integrated parallel approach where all three of these activities may occur at any time, simultaneously, within the facility This approach is more cost-effective as it allows more work to be accomplished with fewer resources, in less time It also significantly reduces exposure of the workers to hazards For example, in the typical series model, workers would perform radiological surveys and other necessary characterization activities, enter each glovebox, and sweep down the box to remove holdup Then, much later, the workers would return to that same box, redo the necessary radiological surveys, etc , and begin the removal process Instead, by performing closure activities in parallel, the team can simply perform the characterization activities once The team can then complete the removal of holdup and the removal on the equipment immediately thereafter, thus eliminating the risk in a shorter time, with fewer resources, and less exposure

Typical Deactivation Process



New Integrated Process

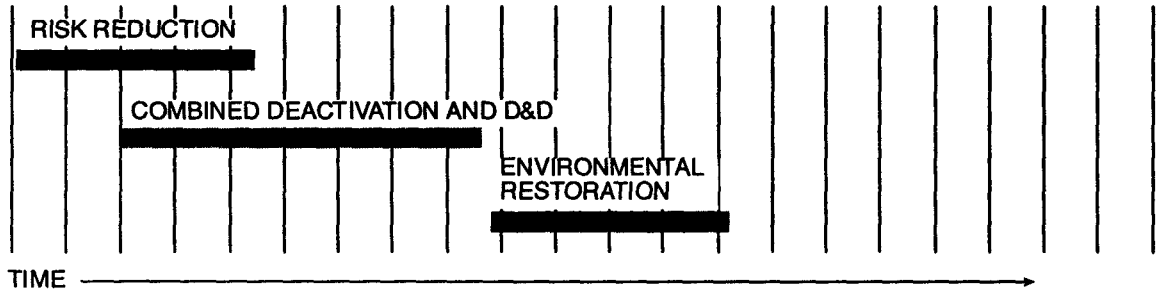


Figure 4-1 Comparison of Closure Approaches

The strategic end points will be achieved through this disciplined six-phase approach Figure 4-1 gives a conceptual view of the relationship of these phases

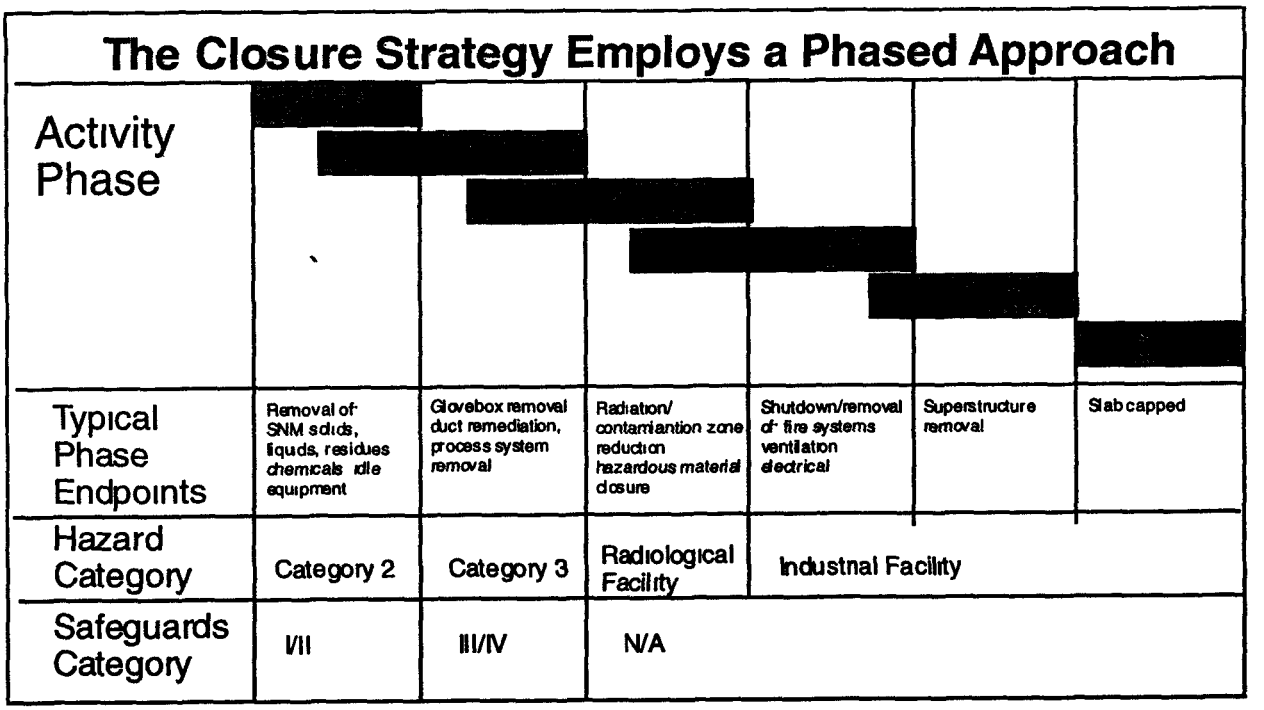


Figure 4-1 Phased Approach to Closure

An overview of the activities that occur in each of the phases are described below in more detail

Phase I - Major Hazard Reduction

- Remove combustibles
- Disassemble and remove loose/free SNM to address criticality concerns
- Drain lines (process, steam, chemical, etc)
- Drain tanks
- Remove equipment internal to gloveboxes
- Wipe down gloveboxes
- Waste characterization and disposal
- Reduce surveillances
- Isolate and contain material that may migrate
- Remove stored SNM material
- Fix radiological contamination and seal gloveports
- Remove radiological contamination and stabilize Rm 141
- Clean up and remove office furniture

Phase II - Equipment Dismantlement

- Remove process piping
- Remove process vessels
- Remove glovebox off-gas and ventilation ducting legs
- Ambient Air Monitoring in place
- Remove Zone I HVAC system
- Remove gloveboxes
- Remove hoods
- Remove process pumps

Phase III - Building Decontamination

- Remove hazardous and radiological contamination to minimize hazardous/radioactive material dispersion during demolition and minimize high cost waste
- Remove non-load bearing walls to minimize high cost waste
- Remove remaining asbestos, lead, mercury, etc

Phase IV - Utility System Shutdown

- Isolate steam to facility
- Isolate water to facility
- Isolate sewer line
- Isolate and liquid effluent discharges
- Deactivate HVAC system
- Remove remaining HEPA filters
- Remove/reconfigure electrical switch gear
- Remove remaining operational system that supported previous phases
- Isolate fire system
- Remove accumulated waste and remaining office furniture
- Isolate pressurized air systems
- Isolate inert systems (N_2, Ar) and O_2 analyzers
- Isolate diesel generators, UPS, and grounding/lightning protection
- Deactivate criticality system
- Deactivate building chemical/gas support

Phase V - Building Demolition

- Demolish building
- Monitor for releases during building demolition
- Disposal of rubble

Phase VI - Site Remediation

- Monitor site for any environmental impacts
- Cap building slab to contain hazardous materials

Documentation - All Phases

- Documentation of End Points performance and completion

- Gathering and transfer of facility records for archive purposes

4.2 Enabling the Goals of Closure

A major piece of the overall closure strategy focuses around how equipment will be selected, prioritized, and dispositioned, in order to enable the goals of closure The first step taken was to select the equipment groups or geographical areas that would be defined as sets This selection process resulted in 81 sets being identified for the 771/774 Closure Project These sets were then evaluated using the criteria located in Appendix 3 Weighting factors were applied to the criteria in order to provide a preliminary prioritization of the sets This preliminary prioritization, combined with solid engineering judgment, enabled the project team to make informed decisions concerning the order in which equipment is removed from the clusters A complete list of the prioritized sets is located in Appendix 4

It is important to understand, however, that this prioritization is not set in stone, but rather will be used as a planning guide for activity order The order in which sets are removed may be affected by several issues Activities may be either delayed or brought forward based on budget, available resources, and approval status For example, priorities 1, 2, and 3 may be ready to work Priority 4, 5 and 6 may be awaiting approvals from regulators, however, priorities 7 and 8 are approved, and can be safely performed ahead of priorities 4, 5 and 6 Priority 9 may be on hold due to a lack of resources, while priority 10 may have exactly the resources required In no case will a lower priority activity be performed when it is not safe or economical to do so For example, the plenum removal (priority 57) would not be performed prior to the removal of the gloveboxes, as it would not be safe to do so This type of error would be prevented by the health and safety controls described in Section 6 Therefore, changing of priorities will not necessitate a resubmittal of this document

4.3 Determining Project End Points

With the sets selected and prioritized, specific end-points were developed The "end points' method utilized at RFETS will build upon the successful process developed and tested at PUREX (Plutonium-Uranium Extraction), a Hanford facility These methods of defining end points for facility stabilization and closure have been extremely effective in planning work and interacting with the regulators and oversight agencies

The end-point method presented here is a top-down, logical process of determining final conditions for each of the facility's systems and spaces based on stated objectives, likely task types, and expected future uses, if any, for that system or space End points are developed in successively more detailed levels, to the point of quantitative or otherwise explicit item-by-item end point specifications suitable for developing engineering work plans and performing field work packages

Several guiding principles form the foundation of the end-point process

- The decision to create an end-point should be driven by, and clearly linked to program objectives, not by feasibility or capability This ensures that the project is not limited by current technology or knowledge Instead, the project is focused on determining the correct end-point first, then on figuring out how to achieve that end-point

- The end point condition of the facility should employ a safety approach, at three levels elimination of hazards, effective facility containment, and facility monitoring and control
- End points are integrally linked to decisions and constraints of resources and methods Cost-effectiveness is important
- End point development requires ownership by all affected organizations, including planners, implementors, and customers
- End points must be clear and quantitative, not vague or functional
- End points are a living document, and may change throughout the project as needed to meet the overall strategic end-points of the project The strategic end-points will not change without a change to the Closure Project Baseline

Every end point is driven by an objective, therefore, the first step is to define the top level closure objectives that will then form the basic criteria for the end points They are

- Protecting the public and the environment
- Complying with regulations and requirements
- Protecting the workers
- Optimizing the costs

The end-point development method supports the development of work plans by providing a task focus This is done by defining a generic series of tasks that take the facility from its existing condition to closure The task areas used for 771 Closure are

- Elimination or reduction of non-nuclear hazards (Phase I)
- Elimination or reduction of nuclear hazards (Phase I)
- Isolate and Contain (Phase I)
- Remove Equipment/Material (Phase II)
- Building Decontamination (Phase III)
- Isolate and Contain (Phase IV)
- Remove Equipment/Material (Phase IV)
- Demolish Building (Phase V)
- Monitor and Control (Phase VI)
- Document (All Phases)

End points deal primarily with the final condition of the physical facility The facility must then be classified by combinations of physical characteristics *and* the end functionality, that is, what the use and access requirements are to be As a result, six cases were determined for the facility that enable groupings of end-point activities

The six (6) cases are

- Systems, Equipment, and Materials, Non-Radioactive
- Systems, Equipment, and Materials, Radioactive
- Internal Spaces, Non-Radioactive
- Internal Spaces, Radioactive
- Building Structures, Non-Radioactive Buildings
- Building Structures, Radioactive Buildings

The end point methods described above are not intended to be prescriptive in nature, but are to be adapted to suit the specific needs of the facility under transition The detailed end points for each facility are contained in the End Points Criteria database These endpoints, along with the prioritized sets, are being used to generate a logic-based, resource-loaded scheduled, as described in Section 10 3 The budget necessary to support this schedule was then created as discussed in Section 10 4

4.4 Characterization Approach

The 771/774 Closure Project requires that the physical, chemical and radiological condition of each set be assessed Characterization is the process of identifying what physical, chemical, biological and radiological hazards are associated with a set and/or facility The hazard may be contained (e g , acid in a tank) or loose (e g , radioactive material on a floor) The hazard may be potential (e g , broken ladder) or immediate (e g , a leaking pipe that contains radioactive material) Characterization is achieved through a combination of facility walkdowns, review of historical records, information from similar buildings, interviews of personnel familiar with building operations, direct measurement, non destructive assay, and sample collection for laboratory analysis The characterization data will be utilized for assessing potential hazards, as a basis for the development of the technical approach to work activities, and to support the proper disposal of property/waste

This section discusses the types and phases of characterization that have been and will be completed for the 771/774 Closure Project

Scoping Characterization

The Scoping Characterization phase is the process of gathering information about facilities' hazards from existing sources The main sources of this information are historical records, routine survey records, facility walkdowns, and interviews with facility personnel and former facility personnel Note that no additional sampling or surveys are necessary in this characterization phase The compilation of this information is used as the basis for preliminary evaluations of proposed decommissioning activities The Scoping Characterization phase feeds information into the Reconnaissance Characterization phase

The 771/774 Closure Project's Scoping Characterization phase is complete The documents that were reviewed in gathering this information are identified in the project files

Reconnaissance Level Characterization

The Reconnaissance Level Characterization phase establishes a definitive baseline of information about the facility's hazards During this phase of characterization the Scoping Characterization is used in conjunction with a review of the proposed decommissioning activities to determine if the proposed activities are feasible and to identify the need for additional sampling and/or surveys If additional characterization information is needed to adequately define the quantity and distribution of contaminants, the additional samples would be completed during the Reconnaissance Level Characterization phase The culmination of this phase results in development of a Reconnaissance Level Characterization Report (RLCR) The RLCR is a summary of all the known characterization information that was obtained for the facilities being investigated The 771 Cluster's RLCR has been completed (Comments are being received from DOE and the regulators which will be addressed and incorporated as appropriate) The 771 RLCR is being used (1) to complete the preliminary hazard analysis, (2) to support the preparation of detailed closure work packages, (3) to estimate the type and amount of waste which is expected to be generated during the closure, (4) to support project plan considerations of dose assessments for ALARA analyses

In-Process Characterization

In addition to the Reconnaissance Characterization, additional radiological, chemical, and safety surveys will be completed, as necessary, to prepare appropriate work authorization documents such as Radiation Work Permits and a Job Hazard Analysis These surveys are typically completed shortly before the work is initiated to ensure conditions have not changed since the work planning stage (If conditions have changed, reviews will be performed as appropriate to determine if other actions/controls are necessary See section 5 2 2 for more details) As the work continues and hazards are removed, further characterization is completed to verify the effectiveness of the decommissioning work efforts This continued sampling and surveys are called In-Process Characterization

Final Building Survey

The Final Building Survey is conducted to demonstrate that the radiological and industrial contaminants within the facility have been reduced to levels that comply with the established release criteria A Sampling and Analysis Plan is intended to be utilized to execute the characterization of the remaining slab The Final Building Survey report will be included as part of the project's administrative record and turned over to the Contractor's Environmental Remediation Department for final site remediation

Independent Verification Survey

This survey may be conducted to verify that the facility and/or material removed meets established release criteria (RFCA ¶¶ 272) The independent verification survey provides an independent review of the Final Decommissioning Survey methodology and survey data Although the scope may vary, typically a confirmatory survey of one to 10 percent of the area is performed Comparisons are made between the independent verification and final surveys Anomalies are identified and addressed

4 4 1 Physical Characterization

Full walkdowns of the facility are being conducted to obtain the physical characterization of the facility This includes dimensional data, as well as physical details such as the amount of lead shielding, Benelex,

number of HEPA filters, etc It will also gather data concerning physical items contained within the equipment such as tools, pumps, vessels, etc

4 4 2 Radiological/SNM Characterization

4.4 2 1 Radiological Contamination/Penetrating Radiation Characterization

The radiological characterization of the facility and equipment will make use of the existing operational radiation protection survey supplemented by additional surveys to determine the presence and/or level of radiological contamination The radiological monitoring of radiation exposure levels, contamination and airborne radioactivity will comply with the requirements of 10 CFR 835, RFETS Radiological Control Manual, NUREG 5849, "Manual for Conducting Surveys in Support of License Termination, Decommissioning Characterization Protocols, and applicable site procedures The characterization surveys will be performed by trained and qualified personnel using instruments that are properly calibrated and routinely tested for operability The results of radiological surveys will typically be documented on a diagram The documentation will contain sufficient detail to permit identification of original survey and sampling locations

Using the facility operations and radiological history, biased sampling locations will be selected to quantify radioactivity based on suspected or known contamination at a given location Examples include horizontal surfaces such as the tops of gloveboxes and piping in overhead areas Unbiased locations of unaffected areas will be selected at random Examples of these include office areas and areas where radioactivity is not expected

It is not intended to consider this characterization the final assessment by which worker protection and safety decisions will be made Additional characterizations will be performed as required to prepare work authorization documents This type of characterization will typically be performed shortly before work is initiated to ensure conditions have not changed and to more accurately assess those hazards This characterization will be used to determine appropriate personal protective equipment to ensure worker health and safety

4 4 2.2 SNM Holdup

Holdup is defined as the amount of nuclear material remaining in process equipment and facilities after the in-process material, stored materials, and product are removed Holdup has been found in Building 771 as oxides (Safeguards and Security attractiveness type C) or low grade materials (type D)

Before holdup measurements can be made, a variety of preliminary actions are accomplished by building and measurement personnel Accurate holdup measurements require that all background radiation sources (e g waste drums) be removed from the measurement area All packaged fissile material should be removed from the gloveboxes and a radiological survey must be performed prior to the measurements All measurement sites must be free of external radiological contamination to insure that measurement equipment is not contaminated and remains usable

All measurement sites require two types of measurements one to determine the types of isotopes present, and the second to determine the quantities present The isotopic determination is accomplished

with Hyper-Pure Germanium (HPGe) detectors that gather spectra in a 50 to 600 keV energy range The second measurement type is accomplished with Bismuth Germinate Oxide (BGO) detectors, which measure multiple locations and quantify isotopic amounts present

Prior to performing field measurements, the measurement systems are calibrated Calibration of a holdup measurement system is the process of determining the response of the detector to known quantities of fissile material The Safeguards Measurements group has adopted the calibration methods established by Los Alamos National Laboratories (LANL) using this point source of plutonium to calibrate both the HPGe and BGO measurement systems Once the appropriate system is calibrated, it is used to perform holdup measurements

In order to put glovebox and equipment measurement values on the accountability system, validating the measurement methodology is required Several steps have been taken to validate the holdup measurement program These include repeatability studies, comparisons of measurement data with amounts of material removed during the remediation process, and technical peer reviews by experts inside and outside RFETS

In addition, the program has been formally reviewed by the RFETS Nuclear Instrumentation Development group, the RFETS Independent Verification Team # 5, the SCIENTECH CSA Team, the EG&G Operational Readiness Review (ORR) Team, the DOE ORR Team, and the LANL Safeguards Assay group in addition to many other informal or partial reviews All have found the program to be technically sound, and recommendations received during each of the reviews specific to the measurement program have been evaluated and incorporated where appropriate

4.4.3 Chemical Characterization

The chemical characterization of the facility will make use of existing process knowledge, supplemented by sample analysis The characterization activities will

- evaluate the chemical characteristics of hazardous material contamination
- assess the environmental parameters that affect potential human exposure from existing or residual chemical contamination
- support the preparation of work plans to enhance safety of the worker
- allow for estimation and compliant management of generated wastes
- ensure worker and public safety
- ensure compliant management of chemicals

Federal and State law and DOE orders require that chemicals be properly managed to assure the safety of people and the environment Chemical management is accomplished considering the health and safety hazards associated with the material and in compliance with legal requirements Generally, chemicals are tracked on a site wide basis to fulfill the regulatory requirements of the Emergency Planning and Community Right to Know Act (EPCRA) Additionally, the chemical tracking provides a management tool to document the storage and disposition of materials on site

Periodically, an inventory is performed of the chemical storage areas During this inventory, the safe handling and storage of chemicals is of the highest priority, and suspected unsafe conditions are to be resolved promptly and safely by a chemist or a Subject Matter Expert (SME) It is expected that unidentified chemicals may be located during the closure process These chemicals will be treated with the utmost care until identification is made because the chemical might be reactive or shock sensitive Characterization will be performed by the SME using process knowledge, or by chemical characterization or analysis In the event that a reactive or shock sensitive chemical is identified, only those employees trained to handle such chemicals will be utilized In this event, trained and qualified personnel, in accordance with applicable laws and regulations will either treat the chemical (through the addition of other chemicals) or dispose of it Detonation of the chemical may be considered as a disposal method, but will not be indiscriminately used and is not a preferred option Any detonation will be reviewed for Clean Air Act requirements NEPA approval for detonation of small amounts of chemicals has been obtained, and is on record This record would be reviewed prior to any detonation to assure there are no major changes that would require another NEPA review In any event, all actions taken will be in accordance with established RFETS procedures, with appropriate approvals

4 4 3 1 Asbestos Characterization

The objective of the asbestos material characterization is to determine the type, quantity and location of asbestos containing building material (ACBM) The characterization of the building will be conducted in several phases These phases will correspond to the work areas identified by the overall building closure schedule Work areas will be characterized prior to the disruption or removal of suspect materials

Asbestos material characterization includes a review of documents detailing facility history, facility construction drawings, facility walkdowns, sample collection and analysis, and evaluation and documentation of results and conclusions The asbestos characterization survey will be designed and managed by a qualified individual per the requirements of 29 CFR 1926 1101 Samples will be collected at locations identified during the review of facility drawings and walkdowns Surveys will be performed by trained individuals who follow written procedures All samples will be tracked from sample collection, transport, and analysis All samples will be analyzed at a certified laboratory Data will be recorded in an orderly and verifiable manner and will be reviewed by a qualified Building Inspector for accuracy and consistency A report will be prepared summarizing laboratory results including sample location, sample description, asbestos type and percentage, non-asbestos fiber types, matrix types and sample color

4 4.3.2 Beryllium Characterization

Work areas and equipment where beryllium is known or suspected of being present will be surveyed prior to disruption or removal of such items or surfaces Beryllium smears will be collected and analyzed from various equipment and equipment surfaces within the facility Sampling and analysis will be conducted by trained individuals in accordance with the RFETS Beryllium Control Program

4 4 3 3 Lead Characterization

Lead shielding and lead-based paint are known to be present in the facility The general approach will be to assume that all painted surfaces are lead-bearing unless proven otherwise This approach will

minimize characterization costs and ensure worker protection Selected lead sampling will be conducted by collecting media samples for analysis and/or with portable lead detection equipment The sampling and analysis will be conducted by trained individuals using written procedures

4.4.3 4 Polychlorinated Biphenyls (PCBs) Characterization

Guidelines are being developed in accordance with the PCB Program Management guidance that will assist in the identification and handling of materials with a potential to contain PCBs The PCB guidance document, once approved, will be used to identify appropriate materials for investigative sampling for PCBs A review of past spills/releases of PCBs has been used in the development of the RLCR, and will be used to identify typical sample locations during closure activities Representative samples of paints, roofing materials, and insulation will be used to determine if non-routine PCB wastes are present

Again, it is not intended to consider this characterization the final assessment by which worker protection and safety decisions will be made Additional characterizations will be performed as required to prepare work authorization documents This type of characterization will typically be performed shortly before work is initiated to ensure conditions have not changed and to more accurately assess those hazards

4.5 General Closure Approach

Provided below are a summary description and typical sequence of operations that will be employed during the closure of work sets within the 771/774 Closure Project These activities will be controlled and authorized, and may be modified as appropriate, to address a specific condition or hazard in a particular set

- Additional radiological, chemical, industrial hygiene, environmental and safety characterization will be performed to prepare appropriate work authorization documents This characterization process will be an ongoing process throughout the closure process to ensure the work area hazards are adequately quantified and proper personnel and environmental protection is provided
- Prior to starting any activities, all involved personnel will participate in a pre-evolution briefing to discuss the proposed work and to review the applicable safety requirements
- If asbestos containing materials will be disturbed as part of the scope of activity, the area will be abated by a qualified contractor prior to start of work that could disturb the asbestos containing material The abatement activity will be carefully coordinated to minimize interference with other activities
- Equipment and horizontal surfaces within a work area/room will be vacuumed and/or wiped down Damp cloth and decontamination fluid and/or tack rags may be used This housecleaning will be performed to minimize personnel exposure to potentially contaminated dust during subsequent decommissioning activities This action would also remove any loose (asbestos, lead, beryllium) radiological contamination
- Electrical power to components/systems to be removed will be de-energized and locked out, tagged out, and disconnected Electrical system conduit that cannot be de-energized or is required for

continued closure activities will be clearly identified Temporary power may be utilized and will be clearly identified and controlled

- Temporary ventilation may be used as necessary
- Piping systems and equipment will be drained, isolated and locked out/tagged out prior to any work on the system/equipment All collected liquids will be appropriately sampled and managed/dispositioned in accordance with site waste management procedures
- Interconnecting system piping, conduit, bracing and supports will be removed as necessary to remove equipment and components from the room
- Equipment within the work area/room will be removed As a general rule, equipment located at floor level will be removed first to allow better access to overhead areas Equipment removal may include the disassembly and decontamination of the equipment if it is determined to be cost-effective or necessary to ensure safety The decontamination efforts may be completed in place or the equipment/glovebox may be moved to another area for decontamination and size reduction A variety of decontamination techniques may be used including, a simple wipe down, use of abrasive material such as scotch brite, steel wool or sandpaper More aggressive methods discussed in the DOE Decommissioning Handbook, (DOE/EM - 0142P), may be used if necessary All equipment and components to be unconditionally released will be surveyed in accordance with the RFETS Radiation Control Manual and associated implementing procedures prior to release

Gloveboxes, B-Boxes And Hoods will be decommissioned using the following approach

- Equipment and components will be removed from the internal portions of the contamination containment device (i e , glovebox) as needed to facilitate waste packaging
- Internal surfaces will be wiped down using tack rags, non-ionic clean solution, loose materials will be swept up as required More aggressive techniques may be used such as abrasive grit blast or other methods discussed in the DOE Decommissioning Handbook, (DOE/EM - 0142P)
- Based on radiological survey measurements, a strippable coating may be applied to fix surface contamination during size reduction operations When appropriate, the strippable coating may be applied and removed several times to reduce surface contamination levels
- Lead shielding on the external surfaces of the gloveboxes may be removed to minimize the generation of mixed waste If mixed IDCs (Lead, stainless steel, etc) are approved, this may not be required
- Prior to the size reduction of a glovebox, B-Box or hood it will be enclosed in a contamination control containment Depending on the layout of the room, the size of the component to be size reduced and radiological contamination levels, a containment may be erected around the equipment in place or the equipment may be moved to a semi-permanent size reduction facility located within Building 771, but in another room/area In any case the contamination control containment will be equipped with HEPA ventilation to control the spread of contamination and minimize worker exposure during size reduction and waste packaging operations

- Workers may size reduce the component using a variety of methods including nibblers, saws and other metal cutting techniques Size reduction may be performed to minimize waste volume and allow packaging in approved containers All waste material will be characterized and packaged in accordance with site Waste Management procedures as described in Section 6 0
- After all equipment and systems have been removed from the room/area the exposed room surface will be radiologically decontaminated and abated for lead and/or PCBs in painted surfaces, as necessary The surfaces will be sampled/surveyed to determine the need for further decontamination and to verify the effectiveness of the decontamination process Room surfaces will typically be decontaminated by wipe down and/or surface scarification methods such as scabbling or other similar technique

As the equipment and systems are cleared from each section of the building, workers will complete the removal of all remaining utilities to the area This will include the ventilation systems and all electrical power within the area The section will then be sealed off until demolition of the building commences

The final engineering packages will be demolition plans for the individual 771/774 Closure Project facilities These plans will detail the work steps and precautions required to accomplish the final dismantlement of the buildings in the clusters Demolition will be performed using lessons learned from the 779 cluster, as well as lessons learned from other sites Every effort will be made to stay abreast of changing technology as well so that all closure activities are performed in the best, safe, and most cost-effective manner

4.6 Regulatory Strategy

The basic philosophy throughout the 771/774 Closure Project will be to meet the requirements of the applicable regulations and compliance agreements, including compliance with the activities listed in the Rocky Flats Cleanup Agreement (RFCA), the site RCRA permit, and the Residue Compliance Order #93-04-23-01, while avoiding activities which are not cost-effective for facilities undergoing closure

In doing so, every effort will be made to coordinate project status and potential regulatory situations with DOE-RFFO as part of the consultative process, to avoid sudden or unexpected shutdown orders Solid planning and communications between DOE and its contractors will be essential, in order to facilitate preparations for the consolidation and disposition of hazardous materials It is also essential to involve and inform regulators early in any regulatory process or negotiation A cooperative spirit is established by such actions, and joint efforts then can be directed at solutions

Furthermore, regulatory issues and needs will be communicated by contractor and DOE experts to all of the managers, engineers, and work planners to ensure solid understanding of the project (Note that contractual needs would be communicated through the RFFO Contracting Officer or Contracting Officer's Representative, via the appropriate contract management process) Just as understanding the methods and needs of the scheduling professionals by the plant operating personnel contributed to better schedules, likewise understanding of regulatory requirements by facility operators will help ensure that regulatory mistakes and violations are avoided This is especially important in a project that will overlap deactivation and D&D activities

4 6 1 RCRA Strategy

There are a large number of RCRA units within the 771/774 Closure project Appendix 5 provides a listing of the units, and current status towards closure Formal closure of permitted and interim status areas is subject to the provisions of 6CCR1007-3, Parts 264 or 265, wherein basic closure methods are described in state approved closure plans and each closure is certified by an independent Colorado professional engineer The operating record of each RCRA unit will be reviewed to determine the appropriate closure criteria Closure Plans as well as Closure Description Documents will be submitted to CDPHE separately from this DOP, as appropriate

Throughout the closure process, efforts may be made to bring each RCRA unit to a RCRA stable configuration, thus reducing inspections

4 6 2 CERCLA Strategy Through RFCA Compliance

4 6 2 1 Background

Rocky Flats has implemented the CERCLA cleanup process using the Rocky Flats Cleanup Agreement (RFCA) RFCA describes the process to undertake cleanup of the site through the facility disposition process Due to the significant levels of contamination found within the 771/774 Closure Project, the facilities are considered to be Type 3, and require this DOP

4.6.2 2 Transition to a CERCLA Regulated Facility

The 771/774 Closure Project will transition to a CERCLA facility during the closure process This transition will occur after deactivation activities are completed within each area For the purposes of RFCA, deactivation is a set of activities that occurs primarily in buildings that were used as part of the nuclear weapons production mission RFCA does not regulate deactivation activities, instead, they are regulated pursuant to the Atomic Energy Act and overseen by the Defense Nuclear Facilities Safety Board (DNFSB) The discussion included here is for the purpose of establishing the end of Atomic Energy Act deactivation and the beginning of RFCA decommissioning

4.6.2.2.1 Deactivation Activities

Because the line between deactivation and decommissioning is not always a clear one, the line between deactivation and closure will be identified through the end points criteria Each end-point criterion is specifically identified as either a deactivation or decommissioning activity The list below serves to illuminate activities that would constitute deactivation under the RFCA definition, within this project

- Disabling systems
  - Draining lines and tanks
  - De-energizing electrical components
  - Shutting off ventilation
- Removing materials

- Containerized radiological waste
- Containerized hazardous waste
- Metal bars, ingots, rolls with economic value
- Chemicals

- Disposing of equipment
  - Relocation on site
  - Transfer to other DOE facilities
  - Decontamination for transfer and subsequent reuse
  - Surplus sales
  - Wastage
- Managing backlog and deactivation process waste
  - Consolidation
  - Packaging
  - Storage
  - Treatment
  - Disposal
- Decontamination necessary to establish a safe and stable condition

With the shift from deactivation to decommissioning comes a shift in primacy from Atomic Energy Act oversight of the Defense Nuclear Facility Safety Board to CERCLA regulation through RFCA by EPA and CDPHE

Activities such as waste chemical removal, disposition of excess property, chemical hazards reduction and placement of RCRA units into RCRA stable condition or their closure may occur either during deactivation or decommissioning

4.6.2.2.2 Decommissioning Activities

The following list of examples of decommissioning activities should help delineate that portion of the disposition continuum that is regulated as decommissioning under RFCA and is therefore covered by this DOP

- characterization of contamination

- hazards identification
- decontamination in preparation for release for reuse or dismantlement
- strip out and removal of glove boxes, ducts and tank/process equipment
- size reduction of glove boxes, ducts and tank/process equipment
- waste minimization activities associated with decommissioning
- dismantlement
- demolition

4.6.2.2.3 Waste Management Strategy

RFCA provides that process wastes and wastes generated during deactivation are CHWA/RCRA-regulated, whereas wastes generated during decommissioning are CERCLA-regulated (RFCA ¶¶s 70-71) However, as described above, this project will be engaged simultaneously in deactivation and decommissioning At such times, it may prove safer, more cost-effective, and more expeditious from an operational stance, to manage the wastes generated from both activities in the same manner For example, if site personnel engaged in deactivation and decommissioning in different rooms of the same building are generating both process and remediation mixed transuranic wastes, the project manager may choose to store all such wastes in a single area and commingle such wastes in common containers If this practice occurs, the wastes will be managed under CHWA/RCRA However, in most cases, process wastes will be managed separately from remediation wastes

A variety of means will be employed to enable the worker to ensure compliance with the correct regulation depending on the work being performed Work packages will be reviewed prior to the start of work to ensure that the waste will be properly handled, segregated, and categorized as appropriate Additional methods of control may include administrative controls, such as identification of the activity and regulating agency on the work package, and physical controls, such as locking waste containers At all times, process wastes will be managed to the current Federal, State, and Local regulations, as mandated by current site procedures Remediation wastes will be managed in accordance with Section 7, Applicable or Relevant and Appropriate Regulations (ARARs)

4.6.2.2.4 Documentation

4 6 2 2 4 1 Administrative Record File

The 771/774 Closure Project Administrative Record File (ARF) is comprised of documents that are considered to be relevant to the selection of this response action This file will be maintained as an ARF until the remedial action is approved A Site Technical Administrative Record Review meeting is held to review the file for completeness DOE then certifies completion of the file Once the decision document is signed, the file becomes the Administrative Record for the 771/774 Closure Project

In addressing the relevance of a document to the Administrative Record, there are two basic questions

- Could the document be used or relied upon by the DOE in deciding how to clean up an Individual Hazardous Substance Site (IHSS), Building or Operable Unit (OU)?
- Will the document be used to inform or involve the public in the cleanup of IHSSs, Buildings, or OUs?

The 771/774 Closure Project ARF was created in accordance with the applicable site and federal requirements EPA, after consultation with CDPHE when necessary, makes the final determination of whether a document is appropriate for inclusion in an AR EPA and CDPHE participate in compiling the AR by submitting documents to DOE RFFO as EPA and CDPHE deem appropriate DOE RFFO forwards these documents to the RFETS AR files The 771/774 Closure Project ARF will be reviewed and approved by DOE RFFO, EPA, and CDPHE before the file is closed at the signing of this DOP

Four information repositories have been established to provide the public with access to the 771/774 Closure Project AR A copy of the 771/774 Closure Project AR is accessible to the public at times other than RFETS normal business hours through the Public Reading Room at Front Range Community College

Information Repositories·

U S Environmental Protection Agency
Region VIII
Superfund Records Center
999 18th Street, Suite 500
Denver, Colorado 80202-2466
(303) 293-1807

Citizens Advisory Board
9035 Wadsworth Parkway
Suite 2250
Westminster, Colorado 80021
(303) 420-7855

Colorado Department of Public Health and Environment
Information Center, Bldg A
4300 Cherry Creek Drive South
Denver, Colorado 80220-1530
(303) 692-3312

U.S. Department of Energy
Rocky Flats Public Reading Room
Front Range Community College Library
3 645 West 112th Avenue, Level B
Westminster, Colorado 80030
(303) 469-4435

4 6 2 2 4 2 CLOSEOUT REPORTS

A Closeout Report will be prepared for the 771/774 Closure Project when work is completed and the analytical data has been received The report will consist of a brief description of the work that was completed, including any modifications or variations from the original decision document The report will also include analytical results, including the results of any confirmatory sampling taken to verify completion of the action to the specific performance standards A discussion of the quantity and characteristics of the actual wastes produced and how the wastes were stored or disposed will also be provided

The report will state that the goals and objectives of the early action were met and if not, what additional work is required The complexity of the Closeout Report and the level of detail will reflect the scope and duration of the action The expected outline for the Closeout Report is shown below (although the format may change to meet the needs of the project)

- Introduction
- Remedial action description
- Verification that remedial action goals were met
- Verification of treatment process (if applicable)
- Radiological analysis (if applicable)
- Waste stream disposition
- Site reclamation
- Deviations from the decision document
- Demarcation of wastes left in place
- Dates and durations of specific activities (approximate)
- Final disposition of wastes (actual or anticipated)

4.7 Building Cleanup Criteria

The purpose of this section is to identify the cleanup criteria (acceptable level) which will be used to release the 771 Cluster facilities

4.7.1 Radiological Release Criteria

The purpose of this section is to provide the radiological contamination cleanup criteria for the 771/774 Closure Project <<It is recognized that this topic is under discussion by RFCA coordinators, however, this is the best information available to the project at this time >> In accordance with the RFCA, residual radiological contamination levels present on building surfaces, equipment and demolition materials will be reduced to a level that will not cause the maximally exposed member of the public (located within site boundaries) to receive, through all potential pathways, an effective dose equivalent (EDE) of 15 mrem above background in any single year When approved, (the RFETS Building Radiation Cleanup Standard (BRCS) is currently being developed by the EPA, CDPHE, DOE) the BRCS will delineate the maximum levels of residual radioactive material allowed to remain on building surfaces, equipment and materials that will not result in exceeding the 15 mrem/year limit The specific surface contamination levels for removable and total surface activity will be determined using an appropriate dose model such as RESRAD or RESRAD-Build Radiological data collected during characterization and final survey will be input into the approved computer model to ensure compliance with the 15 mrem/yr limit Until the BRCS is approved, the radiological contamination limits from the RFETS Radiological Control Manual, the Health and Safety Plan (1-P73-HSP-1810, Appendix 1), and DOE Order 5400 5, Radiation Protection of the Public and the Environment (Figure IV-1) will be used The RFETS Radiological Control Manual contains the most comprehensive table and includes all of the applicable RFETS radiological limits In addition to utilizing the applicable limits, and following RFETS radiation protection implementing procedures, ALARA

principles will be adhered to in order to minimize radiation exposure to the workers, public and environment

Note that the cleanup standard applies to that portion of the building that is left in place (such as the 771 slab) or that portion that will be placed in an area that could cause exposure to the general public Equipment and building structures that are removed and packaged as radioactive will not be decontaminated to these levels If it becomes necessary to remove a portion of the building structure before the final survey can be accomplished, appropriate engineering controls will be put in place to minimize the potential for a radioactive release to the environment These actions may include use of fixative or building an enclosure around the area to be removed

The Final Closure Survey will be conducted prior to the demolition of the facility The sampling frequency, survey techniques, and related methodologies as described in the following closure documents will be used as a guide to develop and implement this final survey

- Nuclear Regulatory Commission's Draft NUREG/CR 5849, Manual for Conducting Radiological Surveys in Support of License Termination, Draft NUREG 1505, and Draft NUREG 1506
- Decommissioning Characterization Protocols

Areas and equipment will be classified as Affected or Unaffected based upon process knowledge, previous building surveys, and characterization surveys Affected areas and equipment will be surveyed extensively in accordance with applicable procedures Typically, building surface areas are gridded in 1 m^2 intervals Total activity and removable alpha and beta-gamma measurements are taken at the center of every 1 m^2 grid or at every grid intersection In addition a 100% scan survey is performed over the entire surface area Unaffected areas, such as offices, are surveyed at less frequent intervals Typically a scan survey is performed on approximately 10% of the building surface area Total activity and removable alpha and beta-gamma measurements are taken at least every 50 m^2 or more often in order to achieve reasonable statistical correlation to ensure at least a 95% confidence level of all data collected Biased samples are obtained at locations most probable of being contaminated, and at other locations as specified by the cognizant radiological engineer

4 7 2 Equipment Unconditional Radiological Release Criteria

The unrestricted release of equipment to be removed from the site will comply with the RFETS Radiological Control Manual, the Health and Safety Plan (1-P73-HSP-1810, Appendix 1), DOE Order 5400 5, Radiation Protection of the Public and the Environment (Figure IV-1) and applicable radiation protection implementing procedures If 10 CFR Part 834 is approved, all applicable practices and procedures will be reviewed and modified accordingly to ensure compliance The RFETS Radiological Control Manual currently contains the most comprehensive table and includes all of the applicable RFETS radiological limits for the release of materials and equipment

4 7 3 Beryllium Release Criteria

The beryllium release criteria and survey methods will conform with current RFETS policies and procedures Building surfaces and equipment suspected of being contaminated with beryllium will be

surveyed to assess the level of contamination The surface contamination housekeeping limit for beryllium is 25 mg/ft^2 Current RFETS practice for protecting personnel from beryllium is to utilize the ALARA principle This includes the use of engineering controls to minimize exposure, medical screening of personnel, and the reduction of limits and the proposed establishment of lower action levels The limit for beryllium is currently being reviewed and a lower action level is being considered The airborne limit for beryllium has been reduced from 2 mg/m^2 to 0 5 mg/m^2 All personnel are trained in beryllium awareness and all sampling for beryllium is performed by qualified personnel

4 7 4 Asbestos Containing Materials (ACM) Release Criteria

Prior to and during the course of the closure project a comprehensive assessment and abatement program will be implemented in accordance with the OSHA Standard 1926 1101, Colorado Reg 8 and the site specific Heath and Safety Practices Manual Characterization, sampling/survey, abatement will be performed by qualified personnel per the requirements of OSHA and EPA and NOSH The clearance standard or maximum allowable asbestos level (MAAL) for areas after abatement was performed is as follows

- 0 01 fibers/cc^2 utilizing the phase contrast microscope means of analytical technique
- 70 structures/mm utilizing the transmission electron microscopy technique

4 7 5 Polychlorinated Biphenyls (PCBs) Release Criteria

The TSCA limit (as an ARAR under CERCLA) for release of PCBs containing solid material is 50 ppm Release criteria for spills will be negotiated as appropriate if necessary

4.8 Project Approach Summary

Figure 4-2 details the overall process for closure Work sets will be selected and prioritized Initial and continuing characterization will be performed A spreadsheet has been developed to evaluate handling and disposal options of the work sets With this information, as well as an evaluation of other factors such as safety, regulatory needs, etc , a final approach for the set will be determined

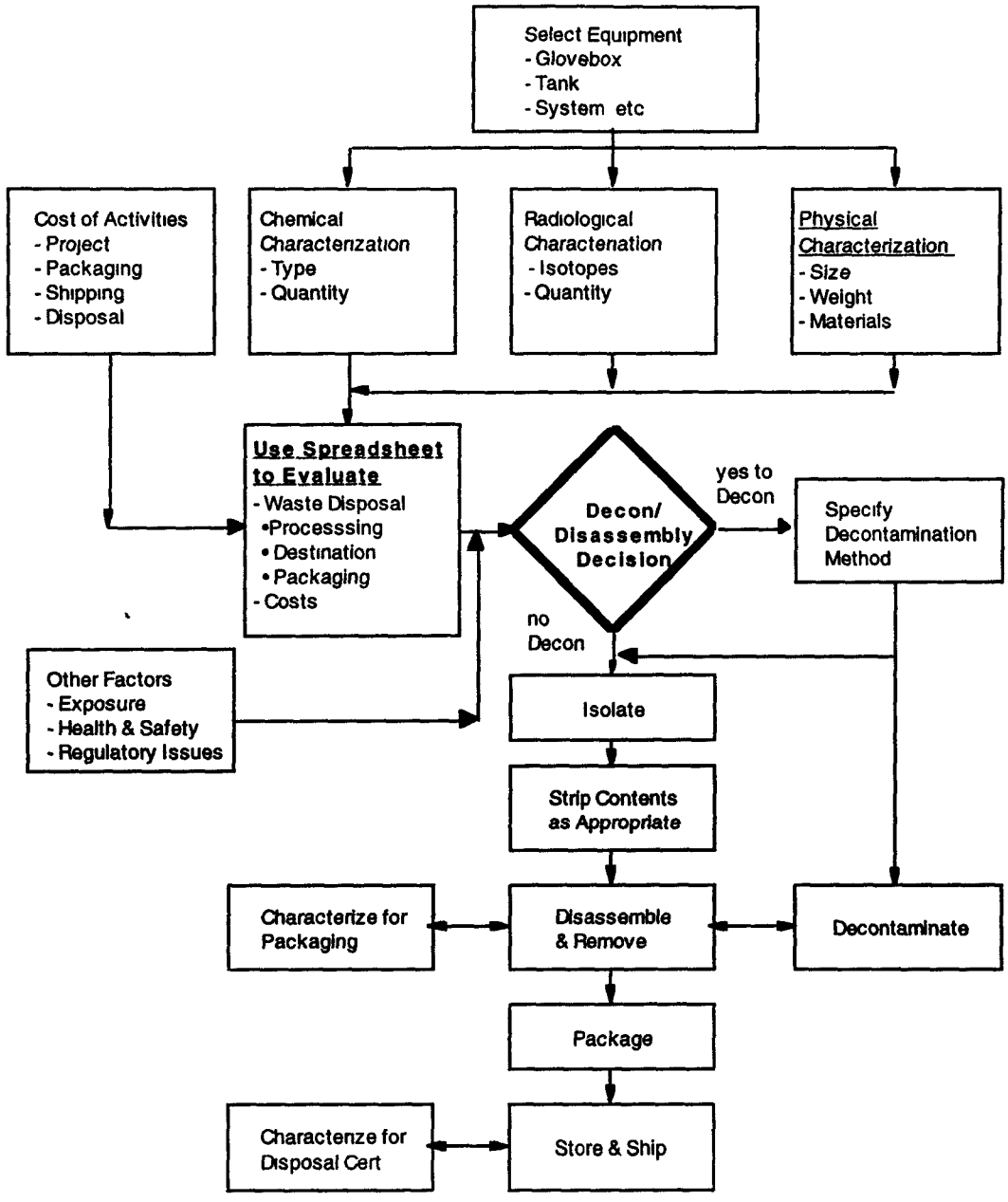


Figure 4-2 Equipment Removal Flowchart

All of the above work is governed by strategies that encompass the entire project Details on these strategies are found in the sections listed below

- Health & Safety (Section 5)
- Waste Management (Section 6)

- Compliance With ARARs (Section 7)
- Environmental Consequences of the Action (Section 8)
- Quality Assurance (Section 9)

Overall, the strategy of the Building 771/774 Closure Project is to safely and cost-effectively close the facility in compliance with all applicable federal, state, and local rules and regulations This will eliminate the costs associated with the surveillance and maintenance (S&M) of this facility allowing these savings to be reallocated towards other risk-reduction activities at RFETS Furthermore, the closure of the Building 771/774 Closure Project will result in a significant reduction of risk at RFETS

5. Health & Safety

Safety is the primary concern at the site As stated in the Lessons Learned from PUREX, *"Worker health and safety, always a DOE and contractor concern, has been elevated in recent years to even more important status Often, worker safety and health aspects of older facility safety documentation will prove to be the area wherein such documentation falls short of modern standards It is important that worker safety and health considerations, comparable to or exceeding the levels demanded by OSHA, be incorporated into newer revisions or supplements of safety documentation "*

The Defense Nuclear Facility Safety Board Technical Report # 15, *Operational Formality for Department of Energy Nuclear Facilities and Activities* describes two key items that must be developed, understood and agreed upon in order to achieve the required formality of operations to perform closure work

- the analysis of a specific scope of work and resulting controls to form the basis for ensuring safe nuclear operations and
- the adoption of practices or safety program commitments to ensure that the work is performed to generally accepted safety standards

These tailored controls and other safety-related commitments are identified and applied to a defined scope of work Defense in depth is implemented primarily though a series of barriers that would have to be jeopardized before harm can occur to people or the environment In addition to the above principles, the Authorization Basis (AB) must facilitate site closure (i e , the AB is concise enough to allow line managers to safely and efficiently perform work) Therefore an integrated safety management process will be implemented that is structured around five core principles (1) define the scope of work, (2) analyze hazards, (3) develop and implement controls, (4) perform work within controls, and (5) provide feedback and continuous improvement The process will facilitate work by identifying key hazards up front and incorporating risk management into the job planning process

5.1 Authorization Basis Strategy

Building 771 is currently operating under the 771 Basis For Operation (BFO), Rev 1 This BFO is being revised to include Building 774 and most closure activities In this revision, the authorization basis is being modified to address the defined scope of closure work qualitatively judged to pose the bounding hazards associated with closure This will establish a safety envelope with a suite of controls adequate to address known hazards of anticipated closure activities

5 1 1 Reduction of Controls

The authorization basis controls will contain the tailored set of safety management system elements necessary to protect personnel and the environment Each major infrastructure program (configuration control, quality assurance, conduct of operations, radiological control, etc) will be addressed An authorization agreement will define the set of applicable orders and requirements, using a graded approach

The authorization bases will enable this graded approach through three methods

- A portion of the Limiting Conditions of Operations (LCOs)/Technical Safety Requirements (TSRs) is already written with applicability statements, and as the hazard is eliminated, the requirement to perform the control will be eliminated For example, when Benelex is removed from the facility, the controls needed in the safety basis will no longer be required
- In many cases, the safety bases will point to programs on site, which utilize a graded approach much like the LCOs, where when the hazard is eliminated, the control is eliminated For example, as radiological contamination areas are decontaminated, the surveys and controls required by the Radiation Control Program will be eliminated as well
- Finally, in some cases, as a hazard is eliminated, a written justification will be necessary to document why controls are no longer appropriate, and with DOE approval, the controls will be eliminated

At some point in the facility closure, it is expected that the Basis For Operations (BFO) will contain only the program controls necessary to protect the worker against normal industrial hazards in a radiological facility Because of the low amounts of plutonium necessary to recategorize Category 2 nuclear facilities as Category 3 nuclear facility status and recategorize Category 3 nuclear facilities as radiological facility status, it would be extremely difficult to change status until late in the closure process However with few or no nuclear facility controls (e g , LCOs/TSRs), there would be little efficiency gained through category changes, since the controls would have already been eliminated, and cost savings are minimal

5 1 2 Evaluation of new activities/hazards

Closure activities not specifically addressed by the AB will be evaluated against that envelope using the unreviewed safety question (USQ) process The AB controls suite will be adjusted as respective hazards are reduced or new ones introduced The authorization basis safety envelope may require adjustment (via the USQ or the annual AB update process with RFFO concurrence) as configuration of the facility is changed, new activities are planned, or new hazards are identified The work will be performed under the defined safety controls and programs by trained workers Reviews and authorization to proceed with activities will ensure recognition of the AB safety envelope

The nature of closure activities requires continuous reviews and feedback to verify proper hazard identification and operational controls Through these reviews, process improvements are expected The current approved safety bases for Bldg 771 is maintained by the facility

5.2 Assessment of Hazards

5 2 1 Known Hazards

A number of hazards are already known to exist in the Building 771 facility The predominant hazard is radiological contamination Building 771 and 774 were used for the recovery of plutonium between 1953 and 1989 During that period, a number of leaks, spills, and a fire in 1957 have contaminated virtually the entire facility at one time or another It has always been standard operating practice to decontaminate an area after spills, leaks or fire, although the level of decontamination is often not known Measuring these levels today, after layers of paint and in the presence of elevated background radiation levels, would

reveal only the hot spots It will therefore be assumed that an area is contaminated, unless otherwise known and verified

Two areas in Building 771 are of special concern Room 141, a pump room, experienced repeated leaks of nitric acid contaminated with Pu The room became so contaminated that about 20 years ago the door to the room was welded shut, and all piping in or out of the room was sealed No one has entered the room since that time Another area of concern is the Line 7A fluorinator, which has historically been a high radiation area

A number of chemicals have been used in Building 771, both for processing and in the analytical labs Most of these chemicals are well documented and are in relatively small quantities One notable exception is hydrofluoric acid The system that used HF is operationally empty, but has not been flushed

Beryllium is known to be left from past operations, although in a limited number of gloveboxes Machine, hydraulic, and lubricating oil and greases exist in various machines, gearboxes, and equipment PCB is also likely to be encountered in transformers and electrical components, paint, roofing materials, and adhesives Due to the age of the facilities, considerable amounts of asbestos (both radioactively contaminated and non-contaminated) are present in the insulation and building materials Lead is also present in the glovebox shielding, and some of the building materials

Aside from the radiological and chemical hazards, Building 771 has the normal industrial hazards expected of any chemical processing/lab area.

Building 774 has much the same operational history as Building 771 Radiological hazards will predominate, followed closely by the chemical hazards Although radiological contamination can be expected in the processing sections of Building 774, the levels should be lower than those experienced in Building 771

The chemical hazard in Building 774 should also be better defined than in Building 771, since 774 has no analytical capability, using chemicals strictly for waste processing These chemicals are well defined from procedures and from process knowledge

The remainder of the facilities in the Building 771 facility can, with three exceptions, be considered as having the normal industrial hazards The first exception are those buildings that were used for the storage of HF As noted before, this system is operationally empty, but has not been flushed The second exception is the acid storage facility After the acids are removed, this facility will present no special hazard The third hazardous facility is the Building 728 process pit The pit may have been used as a process waste storage pit, with the attendant chemical and radiological hazards

5 2 2 Potential Hazards

In addition to the known hazards in each area, there are also potential hazards These hazards, suspected due to process knowledge, lessons learned, or past practices, must also be dealt with in a safe, controlled manner Through the Reconnaissance Level Characterization Report, potential hazards have been identified In planning each activity, precautions against both known and potential hazards are determined, and implemented during the execution of that activity

In the process of cleaning up, and closing down a facility, there is a potential that there will be occasions where an unexpected situation is encountered Rocky Flats' procedure at that point is to stop the evolution, evaluate the hazard, determine appropriate protective measures and other actions necessary to proceed safely and in compliance with all rules and regulations, and with these measures approved and in place, proceed with the activity

5.3 Worker Safety

Worker involvement is a key consideration and a significant Lessons Learned from PUREX "Worker involvement and a graded approach to the levels of safety analysis required for various deactivation tasks are keys to making the safety analysis process useful, efficient, and satisfactory to all concerned The graded approach is cost-effective in that it does not demand a high level of analysis for simple jobs already covered in established procedures Worker involvement is also cost-effective in that it provides a higher level of assurance that workers are participating willingly and without hesitation in the jobs that are required for facility deactivation "

5.4 Integrated Safety Management (ISM)

Each of the above subsections combines and works together to form the Integrated Safety Management process that is essential for safe operations at RFETS This process establishes a single defined safety and environmental management system that integrates standards and requirements into the work planning and execution processes to effectively protect the public, worker, and the environment. The IMC and its subcontractors are committed to using a single integrated system to perform all work safely at the site This integrated system combines a diverse group of people and risk graded infrastructure programs to satisfy the multiple safety environmental and health needs uniformly

In this process, lower risk activities would be considered Routine Work, with a basic Integrated Work Control Procedure (IWCP), and no Activity Control Envelope (ACE) required for safe completion of the work On the other end of the spectrum, more complex, higher risk work may require the preparation of an ACE as well as some manner of readiness determination for this activity Routine work would encompass activities such as removal of lighting, elimination of furniture, cleaning of floors for RCRA closure, etc High Risk work would encompass activities such as glovebox removal, stripout of plenums, etc Figure 5-1 identifies the flowchart for the Integrated Safety Management Process

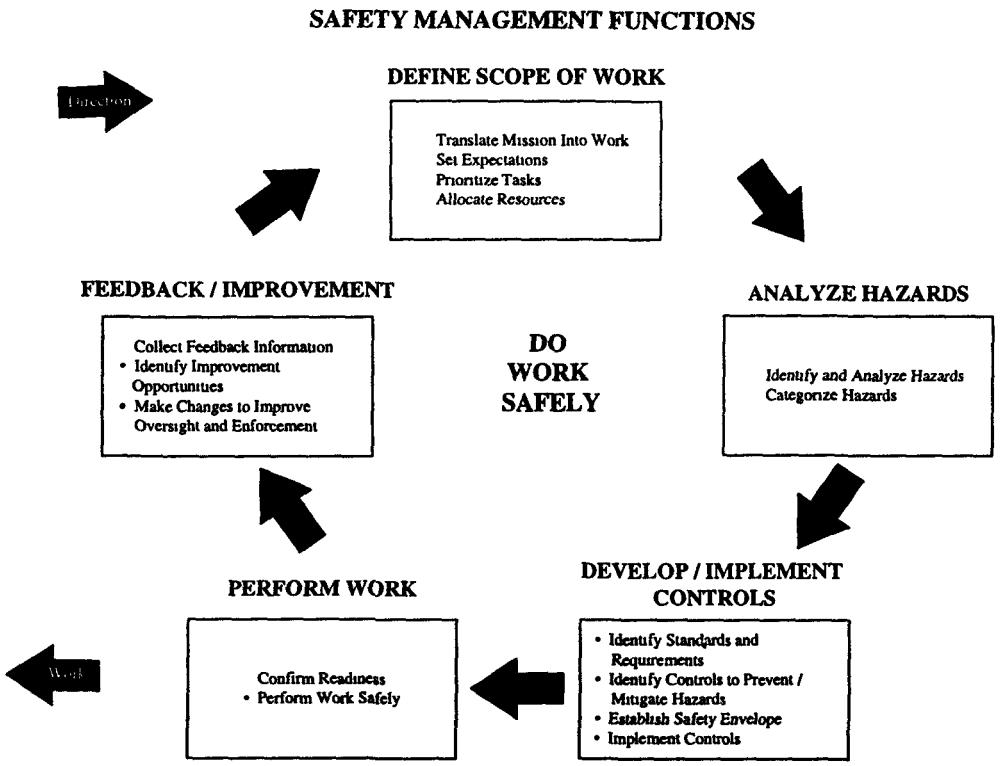


Figure 5-1 Integrated Safety Management Process

5.5 Enhanced Work Planning

Enhanced Work Planning (EWP) is the natural implementing vehicle to involve workers, and to incorporate the five key elements of the Defense Nuclear Facility Safety Board recommendation 95-2 These key elements -- work scope reviewed and prioritized, work scope analyzed for hazards and categorized based on risk, controls established based on hazards, risk, and experience of workers, work performed safely, efficiently, with appropriate degree of supervision, and continuous improvement and lessons learned -- encompass the essence of an effective, efficient, and safety conscience work process EWP also serves as a tool to implement the Integrated Safety Management (ISM) process The ISM process explains how safety is integrated into management and work practices at all levels

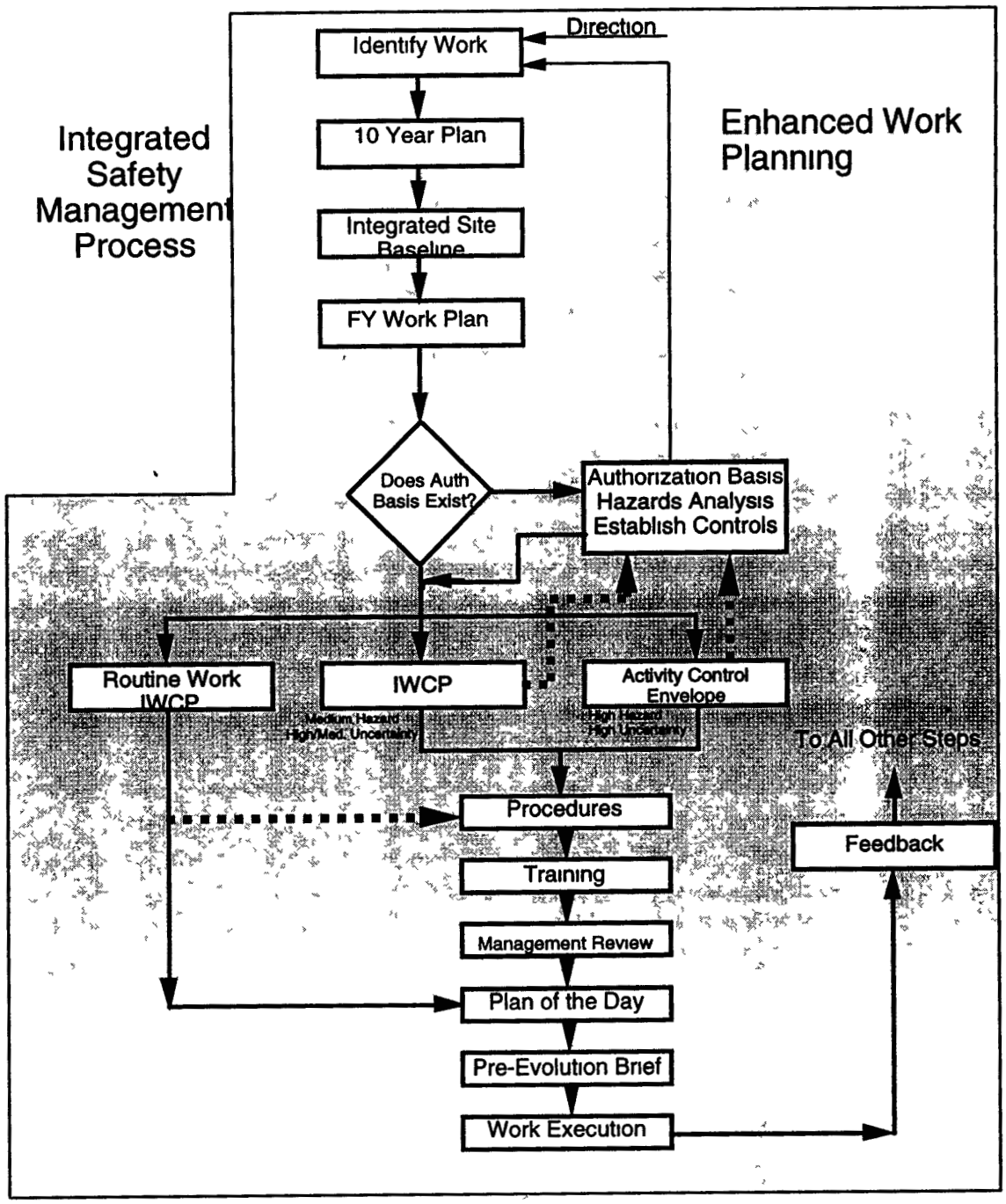
The RFETS Enhanced Work Planning program is designed to provide a safer, more efficient work environment by

- Encouraging worker participation in the initial work planning process to enhance the effectiveness of safety and work efficiency
- Ensuring hazard analysis and controls are appropriate for the job
- Improving worker knowledge of safety requirements
- Fostering teamwork between hourly and salary personnel

- Improving the technical accuracy and workability of work packages
- Balancing the degree of work instruction, skill-of-craft, and worksite supervision
- Reducing the overall time to plan, review, and approve work packages
- Promoting realistic resource-loaded schedules
- Enhancing job coordination and improving the efficient execution of the work
- Continuous improvement through real-time feedback

Enhanced Work Planning considers the entire work process and continually asks the questions necessary to implement a safer, more efficient work control process However, in the traditional approach to the work control process, technical specialists, management, and workers are given work packages for review during various phases of the work planning process When changes are made by one or more of the reviewers, the package must be reviewed again by all parties This sequential review process is inefficient and tends to create conflict between planners, reviewers, and workers Enhanced Work Planning is designed to improve the traditional work control process, primarily through extensive communication and feedback from the appropriate mix of personnel responsible for the work

Figure 5-2 Enhanced Work Planning



6. Waste Management

The processes of decontamination, dismantlement and demolition of RFETS facilities will result in the generation of industrial, hazardous, low level (LL), low level mixed (LLM), transuranic (TRU), TRU mixed (TRM), and radioactively and non-radioactively contaminated PCB and asbestos contaminated wastes which must be managed in accordance with applicable State and Federal regulations The purpose of this section is to address the applicable requirements for waste management activities associated with the closure process and describe the program that will be implemented to ensure that these requirements are met Waste generating activities, waste characterization, and waste certification requirements, contingent upon the disposal waste acceptance criteria (WAC), identified during project assessment, will be used to develop requirements for waste processing, packaging, storage, transportation and to satisfy the WAC for final disposal Relevant information from all active projects will be integrated into the annual Waste Management Plan required by DOE Order 5820 2A, Radioactive Waste Management

6.1 Waste Characterization

Waste characterization will be accomplished by several methods including visual inspections, use of process knowledge, sampling and analysis, nondestructive examination/ nondestructive assay, and radiochemistry Where RCRA characterization is required, Test methods for Evaluating Solid Waste, Physical/Chemical Methods, U S EPA SW-846, 1986, Third Edition (or current version) shall be used for sampling and analysis Process knowledge, quality control procedures, waste characterization, and WAC certification procedures will be developed to support characterization requirements for waste certification plans

6.2 Waste Generation

The Project will generate industrial, hazardous, low level (LL), low level mixed (LLM), transuranic (TRU), TRU mixed (TRM), and radioactively and non-radioactively contaminated PCB and asbestos contaminated wastes This waste will be characterized in accordance with 1-10000-EWQA-1 6 1, WSRIC Program Description, and 1-C75-HWRM-03, Waste Identification and Analysis A pre-job assessment, and sampling and analysis, will be conducted, where necessary, to confirm the presence of hazardous and radiological contaminants within a room, a specific piece of equipment, such as a glovebox, or other components Assessment and analytical data will also be used to determine if some equipment can be salvaged The Building 771 Reconnaissance Level Characterization Report (RLCR) will serve as the documentation for existing characterization and the basis for additional characterization The RLCR incorporates existing WSRIC information, sampling locations, types, and analysis requirements for sampling activities

Each work package will describe the wastes that will be generated during the closure operations phase, based on preliminary characterization and process knowledge obtained prior to the start of the work and the methods that will be used to characterize wastes that will be generated during the closure process Waste estimates will include a detailed description of the wastes that are to be generated by a specific project The volumes and types of wastes to be generated, to include hazardous constituent

characterization as well as radioisotope composition will be included in the volume estimates Volumes for the amounts of LL, mixed, hazardous, TRU, TRU mixed, recyclables, and clean waste will be projected based on engineering estimates for the project Decontamination techniques may be used in order to reduce contamination levels from waste that is initially classified as TRU to waste classified as LL, and LL to sanitary wastes

This section of the work package will also include a description of methods for segregation of wastes into appropriate IDCs and possible methods of decontamination for some waste streams If non-routine wastes are to be generated, then appropriate documentation such as the Non-Routine Waste Origination Logs (NRWOLs) will be completed and sent to the Waste Operations Division to determine temporary storage locations and final disposition requirements From the information collected during this phase of the project, planning can be accomplished for waste certification, treatment and storage, packaging, and off-site shipment of wastes

6 2 1 Low Level (LL) Waste

Low level waste is defined as radioactive waste that is not classified as high-level waste, TRU waste, spent nuclear fuel, or by-product material as identified in DOE Order 5280 2A, Radioactive Waste Management Low level waste contains <100 nCi/gram alpha-emitting transuranic nuclides (The net weight of the waste must be used to calculate the specific activity of the waste in each container) Historical information suggests that approximately 66% of the contaminated waste (including building debris) produced as a result of Building 771 closure activities will be low level in nature (for the 771/774 project as a whole, 94% will be low level in nature) When it is determined to be cost-effective -- or necessary to maintain safety -- items and building surfaces will be decontaminated This may result in reclassification from TRU to waste classified as LL, and LL to sanitary wastes It may also be feasible to remove contaminated portions of equipment to free-release the rest of the equipment Materials that can be decontaminated to a "free-release" level will be identified for use throughout the DOE Complex or other industries Low level waste will be generated and managed in compliance with the RMRS WAC and the RFETS Low Level Waste Management Plan

6 2 2 Transuranic (TRU) Waste

Transuranic waste is defined as waste that is contaminated with alpha-emitting transuranic radionuclides having half-lives greater than 20 years and concentrations > 100 nCi/grams alpha-emitting transuranic nuclides at the time of assay Transuranic waste, as defined, will be generated as a result of the closure of Building 771 Historical knowledge obtained from closure projects suggests that ~ 34% of the radioactive waste generated from 771 itself will be > 100 nCi/gram (For the project as a whole, ~6% will meet that level of contamination) Duct work, gloveboxes, contaminated glovebox windows, downdraft tables, and removable paint used in the decontamination process, are the suspect sources of TRU waste TRU waste that is generated will be managed in compliance with the RMRS WAC, the TRU Waste Management Plan and the Waste Isolation Pilot Project (WIPP) Transuranic Waste Characterization Program Quality Assurance Project Plan

6 2 3 Hazardous Waste/Mixed Waste

A hazardous waste is defined as waste that exhibits the characteristics of corrosivity, ignitability, reactivity, or toxicity or that is listed in 6 CCR 1007-3, Section 261, Subpart B Included in this definition is hazardous waste that has been mixed with LL or TRU material Mixed waste is a subset of hazardous waste The 771/774 Closure Project anticipates generating both hazardous and mixed wastes Sources of hazardous and mixed wastes include, but are not limited to lead, beryllium, fluorescent bulbs, drybox gloves, used chlorinated pump oil (or contaminated with metals), leaded glovebox windows, and some electrical switches Hazardous waste will be generated and managed in compliance with the Hazardous Waste Requirements Manual and approved procedures

Mixed wastes that are anticipated to be generated as a result of this project are identified in the Building 771/774 WSRIC Building Book The Building 771 WSRIC Building Book will be revised to address any new waste streams of substantial volume otherwise a Non-Routine Waste Origination Log (NRWOL) will be generated Mixed waste that results from closure activities will be stored in permitted areas on-site or, where feasible, shipped to an approved off-site disposal or recycle facility

Hazardous and mixed waste (for example, radioactively contaminated lead) may be removed from gloveboxes prior to dispositioning Wherever appropriate, decontamination of gloveboxes may be performed to reduce contamination levels to a point where they can be classified as low level waste Lead that has been attached to gloveboxes and outer surface materials, such as Mycardia (plastic), may be removed and segregated while the gloveboxes are still in Building 771 Additional sources of lead waste include glovebox gloves, lead bricks, pendulums from a chainveyer system, and leaded aprons

6 2.4 Industrial Waste

Industrial waste is, for the purpose of this project, defined as that waste that meets "Subtitle D" landfill requirements Industrial waste will be generated as a result of the 771/774 Closure Project The industrial waste volume associated with the demolition of these structures is 13,600 ft^3 This waste will be managed in accordance with all applicable rules and regulations

Toxic Substance Control Act (TSCA)Waste

Non-radioactively contaminated PCB waste may be produced from the removal of transformers and electrical components, as well as paint, roofing materials, and adhesives This waste will be handled and packaged in compliance with 1-10000-EWQA, TSCA Management Plan

Asbestos Waste

Non-radioactively contaminated asbestos containing materials will be handled in accordance with Colorado Department of Public Health and Environment (CDPH&E), OSHA, and TSCA requirements Radioactively contaminated asbestos waste will be packaged in compliance with 1-10000-TRM-WP-2401, Asbestos Waste Management Containers will be labeled with asbestos warning labels and all other applicable labels and packaging requirements

6.3 Waste Minimization

The closure process will be accomplished in a manner that minimizes the generation of such wastes Waste minimization will be accomplished through a hierarchical approach to waste reduction by eliminating or reducing the generation of closure wastes through application of source reduction methods These methods may include input material changes, operational improvements, process changes and administrative steps Those potential waste materials that cannot be eliminated or minimized through source reduction will be minimized by recycling through reuse or reclamation activities, treating through neutralization, compaction, filtration, evaporation, and stabilization processes, or packaging through segmentation, nesting, and void space management techniques during packaging Commercial waste processing facilities will be utilized if appropriate to minimize waste volume on a cost justification basis

6.4 Waste Certification

Waste certification includes verification that waste characterization, treatment, storage and packaging have been conducted in accordance with the receiving site's WAC Characterization a determination of the physical, chemical, and radiological properties of the wastes to the extent necessary for informed decision making Specific procedures for certification of wastes that address individual receiving sites' Waste Acceptance Criteria (WAC) will be used to insure that wastes are characterized, treated, packaged, stored and transported properly The two main plans which address RFETS waste certification requirements include the site-wide Low Level Waste Management Plan, and the TRU Waste Certification Plan

6.5 Waste Treatment and Packaging

RFETS has several operating waste management facilities with the objectives of processing and packaging liquid and solid wastes generated at the site for safe storage, transport and disposal These facilities were not, however, specifically designed to treat mixed wastes to meet the required LDR treatment standards Treatment and waste handling operations involve many waste types (e g , TRU, mixed TRU, low-level), mixed low-level, hazardous and sanitary or clean wastes) and many forms (e g , liquids, sludges, solids, and compressible solids) Waste treatment activities are conducted primarily in four existing treatment facilities Building 374, Building 774, Buildings 776/777 and Building 995 Treatment methodologies and waste types are described in detail in the RFETS Part B Permit and other site treatment plans Treatability groupings are also established to support the RFETS Proposed Site Treatment Plan (Rev 3, March 30, 1995)

Once closure wastes are package for disposal, they are assayed prior to being transported from the point of generation to on-site storage or shipped off-site RFETS has two (2) active units, the drum assay unit that is located in Building 371 and a crate assay unit, located in Building 569 Real-Time Radiography (RTR) is also utilized to examine the contents of drums prior to shipment RTR provides additional information to assist in certification of the contents of a waste container prior to shipment

6.6 Interim Storage, Transportation, and Final Disposition

For wastes that will not be shipped directly off-site, interim storage locations will be designated for storage of the wastes in permitted on-site storage facilities RFETS has storage capacity to accommodate a total of 34,403 cubic yards of radioactive and mixed wastes Storage requirements for future generation of wastes are currently under evaluation to determine if additional storage will be required (ref Radioactive Waste Storage Environmental Assessment, Public Draft, February 1996) Site surveillance support will be provided to insure that wastes are being managed at each storage facility in accordance with the conditions established in the current RFETS Part B Permit Procedures will be utilized to address shipping requirements and insure that waste shipments meet DOT regulations and the receiving site's Waste Acceptance Criteria

6.7 Waste Estimates

The waste estimates anticipated as a result of the 771/774 Closure Project are summarized in Table 6-1 The types and volumes of waste have been estimated based on the following assumptions

- WIPP facility will be on-line and approved to accept TRU/TRU-Mixed waste in May 1998,
- A size reduction facility will be installed in 771 to minimize waste quantities,
- An interim storage area for Building 771 will be established in Rooms 181A, 182, 183, 184, 179, and 172 This will be the designated storage location until waste is transferred to the RFETS on-site Waste Operations facility,
- The RFETS on-site Waste Operations facility will accept and assay all waste prior to shipment to off-site waste disposal facilities,
- Contents of the 771 office area, 771 trailer complex, 129 maintenance shop, Building 770 and the carpenter shop are non-contaminated The contents will be free-released to PU&D,
- Non contaminated rubble and debris will be disposed of at an approved off-site landfill,
- One hundred percent of the Building 771 and 774 internal structures (floors, walls, ceilings) are contaminated,
- No attempt will be made to decontaminate the Building 771 and 774 internal structures or contents to a free-release category,
- Decontamination methods will be utilized as necessary to reduce the Building 771 and 774 structures to a low level waste category,
- Building 771 and 774 structures will be disposed of as low level waste, and
- All non-contaminated lead will be shipped to PU&D for recycling

Further refinement regarding the number of containers may result from non-standard sized equipment and materials that may be placed into oversized containers rather than being size reduced

Table 6-1 Waste Quantities

	Bldg 771	Bldg 774 and B O C	Decon-tamination	Demolition	Totals
LL					
Boxes	1,381	177	0	8,520	10,078
Drums			2,816		2,816
Cubic Feet	116,004	14,868	20,698	715,680	867,250
LLMW					
Drums	287				287
Cubic Feet	2,109				2,109
Pounds	251,125				251,125
TRU/TRM					
TRUPACT-II SWB	891				891
Cubic Feet	60,321				60,321

B O C Balance of Cluster

6.8 Completion Report

Upon completion of the Project, a completion report will be prepared This report will include a listing of the wastes removed from the building, characterization data, and waste dispositioning information (e g , size reduction, decontamination, or treatment) which contributed to the final forms and volumes of the wastes resulting from this Project

7. Applicable or Relevant and Appropriate Requirements

As noted earlier, accelerated actions at RFETS must attain, to the maximum extent practicable, compliance with Federal and State Applicable or Relevant and Appropriate Requirements (ARARs) The ARARs relating to this proposed action are identified in this section and summarized in Table 7-1 In addition, Table 7-1 identifies whether the requirement is applicable, relevant and appropriate, or To Be Considered (TBC)

Pursuant to RFCA ¶16a, the procedural requirements to obtain federal, state, or local permits are waived as long as the substantive requirements that would have been imposed in the permit process are identified (RFCA ¶17) Furthermore, the method used to attain the substantive permit requirements must be explained (RFCA ¶17c) The following discussion is intended to compliment other descriptions provided in this DOP in a manner that satisfies the RFCA permit waiver requirements

7.1 Air

Closure activities have the potential to generate particulate, radionuclide, fugitive dust, and Hazardous Air Pollutant (HAP) emissions 5 CCR 1001-3, Regulation No 1, governs opacity and particulate emissions Regulation No 1, Section II addresses opacity and requires that stack emissions from fuel-fired equipment must not exceed 20% opacity Regulation No 1, Section III addresses the control of particulate emissions Fugitive particulate emissions will be generated from demolition and transport activities Control methods for fugitive particulate emission should be practical, economically reasonable, and technologically feasible During demolition activities, dust minimization techniques such as water sprays, may be used to minimize suspension of particulates In addition, demolition operations will not be conducted during periods of high wind The substantive requirements will be incorporated into a control plan that defines the level of air monitoring and particulate control for the project

CR 1001-3, Regulation No 3, provides authority to CDPHE to inventory emissions Regulation No 3, Part A, Section describes Air Pollutant Notice (APEN) requirements If applicable, RFETS will prepare an APEN to facilitate the CDPHE inventory process

The Kaiser-Hill Air Quality Management organization provides monitoring support for RFETS specifically directed toward compliance with all state and federal environmental laws originating from the Clean Air Act and its amendments The existing Radioactive Ambient Air Monitoring Program (RAAMP) continuously monitors for potential airborne dispersion of radioactive materials from the site into the surrounding environment Thirty-one samplers compose the RAAMP network Twelve of these samplers are deployed at the site perimeter and are used for confirmatory measurements of off-site impacts The others are used for backup, should there be a need for determining local impacts from closure projects During the demolition of the 771/774 Closure Project, additional monitors within the existing ambient network located in the immediate area of Building 771/774 will be identified The frequency of filter collection and filter analysis at those locations will be adjusted, as necessary, to provide timely information of potential project emissions Air emissions from strip-out activities will be monitored by the existing effluent air monitoring system currently in place in the facilities' plenums, or other appropriate air monitors

Additionally, the National Emission Standards For Hazardous Air Pollutants (NESHAP) (5 CCR 1001-10, 40 CFR 61 Subpart H) have been identified as a chemical-specific (for radionuclides) ARAR to evaluate potential radionuclide emissions The EDE will be calculated for all radionuclide emissions anticipated from the operations associated with facility closure Estimated controlled radionuclide emissions are not expected to exceed the EPA notification and approval threshold of 0 1 mrem per year EDE (40 CFR 61, Subpart H) Radionuclide emission from the project will be included in the site radionuclide annual report

7.2 Waste Storage

The wastes generated during the D&D activities governed by this DOP are remediation wastes (See RFCA ¶25bf and RFCA Appendix 3, the Implementation Guidance Document, section 3 1 10) Remediation waste generated during this removal action will be evaluated consistent with the requirements of RCRA Part 261 Identification and Listing of Hazardous Waste, specifically Subparts A through C Solid remediation waste will be generated and managed in accordance with the Colorado Solid Waste Disposal requirements 6 CCR 1007-2 In addition, sections of Part 268, Land Disposal Restrictions, applicable to off-site shipment and disposal of hazardous waste are ARAR

If necessary, remediation waste will be managed in a temporary unit established pursuant to §264 553 However, the TU's will be kept open for the life of the project, which is an exception to §264 553, ¶ d The requirements governing Temporary Units (TUs) are applicable to tanks and containers used for storage and treatment of hazardous remediation wastes generated in conjunction with the decommissioning Incompatible wastes, if encountered, will be segregated within the units An assessment will be performed to determine the need for secondary containment Secondary containment will be provided, as appropriate, when liquid wastes are stored or treated in tanks or containers Waste characterization will be provided, as appropriate, in accordance with the RLCR and the 771 Cluster Waste Management Plan (WMP) Inspections will be conducted during operations at the frequency detailed below

- Physically solid wastes - Quarterly inspections
- Physically liquid wastes - Monthly inspections

Training for individuals generating and handling waste will be implemented using the framework identified in the RFETS Part B permit To close a TU, wastes will be removed, as appropriate When tanks are operationally empty, berms providing secondary containment will be removed to facilitate equipment removal The information in this paragraph is being provided to satisfy the permit waiver conditions in RFCA ¶17

7.3 Waste Treatment

Any waste, soil/waste mixture, debris, liquid, or remediation wastes that is identified as a hazardous waste requires treatment to the LDR treatment to standards for wastewater or non-wastewaters, as appropriate (See 40 CFR §268 40, Treatment Standards for Hazardous Wastes)

Solidification of characteristic hazardous remediation wastes may be conducted within a temporary unit For example, scabbling of low level, RCRA characteristic lead-based paint may result in a remediation waste form amenable to solidification The solidification would be conducted within competent tanks or

containers and subject to waste analysis conditions imposed in the WMP There would be no treatment for wastes that the site would put in a CAMU, if a CAMU is approved The information in this paragraph is being provided to satisfy the permit waiver conditions in RFCA ¶17

7.4 Debris Treatment

Where appropriate, the project decontamination pad (located in the Protected Area) or one of the site-wide Decontamination Facilities (located in the contractors yard) may be configured to perform low level, hazardous or mixed waste debris treatment in accordance with 40 CFR §262 34, §268 7(a)(4) and §268 45 The information in this paragraph is being provided to satisfy the permit waiver conditions in RFCA ¶17

Solid residues from the treatment of debris containing listed hazardous wastes will be collected and managed in accordance with RCRA hazardous waste management ARARs Any solid residues from debris treatment that exhibit a hazardous waste characteristic will also be managed in accordance with RCRA hazardous waste management requirements

Liquid residues from the treatment of debris containing listed hazardous wastes are subject to RCRA hazardous waste management ARARs until they are placed into the Building 891 Wastewater Treatment Unit Headworks Any Building residues that result from the treatment of listed debris will carry the same listing as the listed debris from which it originated Alternatively, liquid residues that meet acceptance criteria may also be treated in Building 374 or the sewage treatment plant in compliance with the RCRA and NPDES permits

7.5 Wastewater Treatment

Remediation wastewaters generated during decommissioning may be transferred to the Consolidated Water Treatment Facility (CWT Building 891) for treatment Remediation wastewaters that contain listed RCRA hazardous wastes or exhibit a RCRA characteristic are not subject to compliance with RCRA hazardous waste requirements because the wastewaters are CERCLA remediation wastes being treated in a CERCLA treatment unit The CWTF will treat the remediation wastewater to meet applicable surface water quality standards under a National Pollution Discharge Elimination System (NPDES) ARARs framework Waste generated at Building 891 as a result of treatment of a listed remediation wastewater will be assigned the corresponding listed waste code All wastes generated at Building 891 will also be evaluated for hazardous characteristics The information in this paragraph is being provided to satisfy the permit waiver conditions in RFCA ¶17

Alternatively, remediation wastewater that is determined acceptable for treatment may be transferred to Building 374, to the sewage treatment plan (Building 995) or directly discharged in compliance with the administrative and substantive terms of the RFETS NPDES Permit Because these wastewater management alternatives are authorized in the NPDES Permit no permit waiver is required

7.6 Asbestos

Compliance with asbestos requirements is an applicable ARAR and will be achieved in accordance with Regulation 8 Specifically, Section III, C 7 6, provides maximum allowable asbestos levels, and section C 8 2(b), (d) and (f) provides requirements for handling asbestos waste materials In addition, the project will adhere to regulatory notification requirements for asbestos abatement mandated in Regulation 8, Part B, Section III B

Regulation 8 also governs work practices aimed at the protection of the worker/public and is virtually identical to the OSHA requirements in 29 CFR 1926 1101 At RFETS this is controlled through the Industrial Hygiene and Safety group in accordance with HSP 1-62200 HSP-9 09 NESHAP standards for asbestos will be implemented through specific operational directions in IWCPs in accordance with Regulation 8, Part B

7.7 Polychlorinated Biphenyls

Screening for PCBs will be performed on suspect materials prior to demolition The Reconnaissance Level Characterization Report details the current areas suspected of PCB contamination (transformers and electrical components, paint, roofing materials, and adhesives) For example, fluorescent light ballasts are a potential source of PCBs in the 771/774 cluster Light ballasts marked "No PCBs" or "PCB Free" will be managed as solid waste and disposed at a sanitary landfill Ballasts marked "PCBs" or not marked and not leaking will be packaged for disposal at an TSCA-permitted facility Leaking PCB light ballasts and unmarked light ballasts will be managed as fully regulated PCB articles

Any other materials, identified through In-Process Characterization as suspect of containing $\geq$50 ppm PCBs, will be managed in accordance with 40 CFR Part 761, Disposal Of Polychlorinated Biphenyls Radiologically contaminated PCBs will be managed in accordance with the applicable FFCA until a final storage facility is approved

7.8 Radiological Contamination

Due to the likelihood for radiological contamination in the 771 Cluster, guidelines contained in DOE Order 5400 5 have been identified as TBC In the event that radiological contamination is identified, DOE Order 5400 5 will be followed to ensure protection of the workers, the public, and e environment In addition, DOE Order 5420 2A, "Radioactive Waste Management" has been identified as TBC and contains the requirements for the management and packaging of LL waste

Table 7-1 Federal And State ARARs for the 771/774 Closure Project

Action	Requirement	Prerequisite	Citation	ARAR
Air Quality	Compliance with air emissions	Control of emissions for smoke, particulate, and volatiles of concern Implemented for construction activities, haul roads, haul trucks, demolition activities	5CCR 1001-3 Reg 1 5CCR 1001-9 Reg 7	Applicable
Air Quality	Compliance with NESHAP	Regulated radionuclide emissions from DOE facilities with a limit of ten mrem/yr site standard	5CCR 1001-10, Reg 8 40 CFR 61 Subpart H	Applicable
Air Quality	Compliance with NAAQS	Maintain quality of ambient air for criteria pollutants	5 CCR 1001-14	Applicable
Air Quality	Emission standards and compliance with asbestos work practice requirements	Standards for demolition, storage, and handling of waste Implemented through specific operational directions in IWCPs	5 CCR 1001-10 Reg 8	Applicable
Air Quality	Compliance with Hazardous Air Pollutant Requirements	Implemented if the remedial action involves a specific regulated pollutant, e g , lead	5 CCR 1001-10 Reg 8	Applicable
Air Quality	Compliance with ozone depleting compound requirements	Ensure refrigerants are disposed of properly Approved vessel recovery method must be used	5 CCR 1001-19 Reg 15	Applicable
Solid Waste	Solid Waste Disposal Act	Requirements for disposal of solid wastes	6 CCR 1007-2	Applicable
TSCA	Disposal of PCBs	Ensure that any materials within $\geq$ 50 ppm for PCBs are managed according to TSCA and FFCA	40 CFR Part 761 FFCA	Applicable
Hazardous Waste	Compliance with Colorado Hazardous Waste Act	Identification and characterization of hazardous waste	40 CFR 261 6CCR 1007-3, Part 261	Applicable
Generator Standards	Standards Applicable to Generators of Hazardous Waste	Generator prepares a manifest if hazardous remediation wastes are disposed of offsite	40 CFR, Part 262 6 CCR 1007-3	Applicable
TSD Facility Standards	Temporary unit container and tank storage requirements	Requirements for operation of temporary tank and container storage areas	40 CFR 264 553 6 CCR 1007-3, 264 553	Applicable
Closure	Closure of Permitted RCRA Units	Implemented if RCRA permitted units are closed	40 CFR Part 264 6 CCR 1007-3 Part 264	Applicable

Table 7-1 (Continued)

Action	Requirement	Prerequisite	Citation	ARAR
Closure	Requirements for Closure of RCRA Interim Status Units	Implemented if RCRA Interim Status Units are closed	40 CFR Part 265 6 CCR 1007-3 Part 265 as provided in RFCA Attachment 10	Applicable
LDR	Treatment standards for hazardous waste	Requirements for treatment and land disposal of hazardous waste	40 CFR 268 6 CCR 1007-3, Part 268	Applicable
Universal Waste Management	Requirements for Universal Waste Management	Governs batteries, pesticides and thermostats	40 CFR Part 273	Applicable
Used Oil Management	Requirements for Used Oil Management	Implemented if used oil is managed	40 CFR Part 279	Applicable
Water	NPDES Requirements for discharging water into surface water bodies	Requirements for discharge of stormwater or treated wastewater into surface water bodies	40 CFR Part 122 and 125 5 CCR 1002-8	Applicable
Low Level Waste Disposal	Low Level Waste Disposal	Requirements governing offsite disposal of low level radioactive waste	10 CFR Part 61 6 CCR 1007014	Applicable
Radiation Protection	Standards for radiation protection	Establishes the criteria for the protection of human health and the environment	DOE 5400 5	TBC
Radioactive Waste Management	Radioactive Waste Management	Requirements for the management and packaging of LL	DOE Order 5429 2A	TBC

C - Chemical Specific ARAR
L - Location Specific ARAR
TBC - To Be Considered

8. Environmental Consequences of the Action

A mandate to incorporate NEPA values into RFETS decision documents is codified in the Rocky Flats Cleanup Agreement In recognition of this requirement, this section provides a description of potential environmental impacts that may be associated with the 771/774 Closure Project This information is taken from the Rocky Flats Cumulative Impact Document (CID) published by DOE in 1997 Under site closure, the CID examines the complete decontamination, closure and demolition of a generic 100,000 square foot plutonium contaminated facility

The Cumulative Impacts Document has looked at specific impacts and risk associated with the facility disposition process Further, the Cumulative Impacts Document looks at impacts and risks relative to human health and safety, and the environment for a baseline case (no action alternative) and a closure case (case 2 of the Ten Year Plan)

8.1 Analysis of 771/774 Closure Project

Specifically, the CID examines the complete closure of a generic 100,000 square foot plutonium-contaminated facility In comparison to the generic facility, Building 771 is an approximately 150,000 square foot structure The discussion below describes the data collected and impacts analyzed for these two alternatives as they apply to the 771/774 Closure Project as appropriate

8.1.1 Environmental Impact Issues

As described in earlier chapters, the 771/774 Closure Project is located entirely within the (secured) Protected Area of the site's Industrial Area (see Figure 2-1) Initial investigations show that many interior surfaces, process drains, piping, gloveboxes, filters, sumps, and other equipment are radioactively contaminated

The proposed closure activities for the 771/774 Closure Project involve asbestos abatement, decontamination of interior surfaces and equipment by vacuuming and wiping, disconnection of electrical power, draining of piping systems and equipment, removal of gloveboxes and other equipment, further decontamination by wiping, washing, scabbling, and other methods, and dismantling and demolition of the buildings Many of these activities could qualify as categorical exclusions under DOE's NEPA regulations (e g , removal of asbestos from buildings (B1 16), demolition/disposal of buildings (B1 23), disconnection of utilities (B1 27), and minor activities to place a facility in an environmentally safe condition, no proposed uses (including reducing surface radiological contamination, but not including conditioning, treatment, or processing of spent nuclear fuel, high-level waste, or special nuclear materials) (B1 28)

Given the existing environment and industrial setting, environmental impact issues associated with the 771/774 Closure Project are limited in scope The proposed activities should not result in discernible adverse effects to biological resources, including vegetation, wetlands, wildlife habitat, and state and federal sensitive (e g , threatened and endangered) species populations or habitat The buildings to be closed are not located in a floodplain and the proposed activities will not be affected by, or themselves affect, any floodplain However, due to the building's proximity to the segment of the Walnut Creek drainage located in the Protected Area, this activity may require consulting with the US Fish and Wildlife

Service (USFWS) for downstream impacts to the Preble's habitat A USFWS consultation would determine mitigation measures required by to be employed as appropriate No wild and scenic rivers, prime agricultural soils, parks or conservation areas, or natural resources will be affected The proposed activities will provide employment for a very small number of people, most from the current site work force, thus the activities are unlikely to result in adverse socioeconomic effects Closure is not expected to be noticeable off site and thus is not expected to result in major changes in visual quality of the Rocky Flats community area

Therefore, this discussion of environmental impact issues focuses more intensely on the following areas of potential impacts

- Mobilization of radioactive and other contaminants into the environment via soils, air, surface waters, or groundwater,
- Health and safety of workers who may be exposed to radioactive and toxic or hazardous materials (including lead, asbestos, and PCBs), and health and safety of the public, both during normal closure activities as well as accidents,
- Environmental issues associated with waste management, including the contribution of wastes generated by the proposed activities to the decreasing site-wide capacity for interim storage and transportation of waste,
- The physical removal of Building 771 as an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities at Rocky Flats, and
- This project's contribution to site-wide cumulative impacts

8 1 2 Geology and Soils

Closure activities in the 771/774 Closure Project will disturb minor land acreage, most of which has been previously disturbed Activities such as excavation could cause localized landslides or slumping to occur Some recontouring of the soils may occur after buildings are removed to restore soil in areas disturbed by demolition equipment There will be short-term increases in soil erosion and siltation and small, temporary losses of soil productivity VOC and radionuclide contamination already exists in the Building 771 footprint and adjacent areas Additional contamination of soils from closure activities is not expected because building structures will be decontaminated prior to demolition of the structures themselves

8 1 3 Air Quality

Potential impacts to air quality resulting from the closure of the 771/774 Closure Project buildings include asbestos emissions resulting from asbestos removal, Beryllium emissions resulting from the decontamination and removal of equipment and building materials, radionuclide emissions resulting from the decontamination and removal of equipment, hazardous air pollutant from removal of chemical systems, and fugitive dust emissions resulting from transportation activities associated with the closure and demolition activities Air emissions from these activities will be controlled and monitored in accordance with the site Health and Safety Program

Asbestos is present in several areas, primarily in the form of pipe insulation These materials will be removed by a properly certified contractor in accordance with applicable state and federal regulations Assuming that the removal, transportation, and final disposition are in accordance with applicable regulations, there is minimal risk of an asbestos release to the air

Some equipment within Building 771 is potentially contaminated with beryllium The housekeeping action level for beryllium contamination is 25 $\mu g/ft^2$ Cleanup and removal of materials and equipment contaminated with beryllium has a very small potential to cause a release to the air Management of the contaminated materials and equipment in accordance with current site procedures will result in minimal risk to both on- and off-site personnel

Decontamination, size reduction, removal, and ultimate disposal of equipment and materials in Building 771 have the potential to release radionuclides to the air Decontamination and size reduction activities take place within containment (either glove box, B box, or hood) that is equipped with a HEPA filter In addition, the building room exhaust is equipped with HEPA filters This essentially eliminates the potential for a radionuclide release short of an accident during the transportation of the contaminated material Stack monitoring is also conducted to ensure the integrity of the HEPA filtration equipment

Decontamination, size reduction, removal, and ultimate disposal of equipment and materials in Building 771 also have the potential to release chemicals to the air Mitigative actions may be taken to reduce the resulting emissions as appropriate

Fugitive dust emissions will result from the transportation of materials and wastes from the 771/774 Closure Project There will be significant, short term fugitive dust emissions during the demolition of the structure itself without taking mitigation measures Building 771 is a reinforced concrete and cinder block construction that will require the use of heavy equipment to reduce Because of the distance of the Cluster from site boundaries, impacts will be short-term to personnel working in areas approximate to the 771/774 Closure Project

Miscellaneous chemicals and other hazardous materials will be removed from several structures within the 771/774 Closure Project These materials will be managed in accordance with existing site procedures and there will be little risk for air emissions

8 1 4 Water Quality

Because the slab of Building 771 will remain in place, and no other structures of the 771/774 Closure Project will be removed below ground level, completion of the 771/774 Closure Project is not expected to change storm water runoff, storm water percolation, or surface water flow characteristics (Changes resulting from remediation activities outside this project will be dealt with in their documentation)

Potential impacts to water quality resulting from the 771/774 Closure Project include the release of liquid wastes contained in the facility storage tank, impacts to storm water runoff during building demolition

Building demolition can result in particulate runoff in storm water unless preventative measures are taken Depending on the total area affected and current State of Colorado regulations, this action may require a specific storm water permit modification

Because 771/774 Closure Project will remove portions of ancillary structures (trailers) off ground level, some new bare ground is expected to be exposed to wind or water erosion If appropriate in specific instances, silt fencing or similar protective device would be installed to prevent or minimize the possibility of water-borne soil leaving the immediate area and entering drainage ways Demolition activities may, however, deposit small debris on the surrounding pavement or ground surface that could be carried away by storm water runoff Quantities of such material are expected to be small

Among the techniques under consideration for decontamination of the 771/774 Closure Project are the use of water or steam to remove radiological contamination and loose debris While this technique is effective in removing radiological contamination, it also generates large volumes of potentially contaminated water and may even contribute to the spread of radiological contamination Surface water samples from the 771/774 Closure Project drainage sub-basin will be collected using an automated station located to pull samples from the entire sub-basin's runoff Water used for decontamination will be treated prior to release

Because no work will be done below ground level, ground water should not be affected

8.1 5 Human Health Impacts

Closure has the potential to expose involved workers, non-involved workers, and expose the public to radiological and other chemical contamination because the nature of the work is to remove or fix-in-place contamination Disruption of contaminants or hazardous materials increases the chance of the contaminant or materials being dislodged, becoming airborne, and being inhaled by or deposited on humans

8 1.6 Radiological Impacts

For involved workers, closure activities at Building 771 are estimated to result in an average yearly dose of 100-200 mrem to each worker involved in closure the Building Cluster Annual exposures are expected to decline over the life of the project, as higher risk activities are addressed early on in the process This exposure would be expected to result in less than 1 (0 07) latent cancer fatalities, assuming the same worker group conducted both deactivation and decontamination activities Doses to co-located workers from closure operations at Building 771 alone have not been evaluated However, the annual radiological exposure of a maximally exposed co-located (unprotected) worker as a result of site-wide closure activities is estimated at 5 4 mrem (a mrem is 1/1000 of a rem) The corresponding risk of a latent cancer fatality to this worker is two in 1,000,000 (CID, Section 5 8 1)

Annual dose to the maximally exposed off site individual from site closure activities is estimated at 0 23 mrem, with a corresponding excess latent cancer fatality of 1 in 10,000,000 The annual dose to the public as a result of all activities in the RFETS closure project at the peak time of exposure (1997 - 2006) is expected to be a total of 23 rem for all of the 2 7 million people projected to be living within 50 miles of the site in 2006 This annual dose of 23 person-rem would be expected to result in less than one (0 01) latent cancer fatality in the entire Denver area population Estimated annual dose to the maximally exposed off-site individual is well below the applicable standard of 10 mrem/year (CID, Section 5 8 2)

Estimated doses from the 771/774 Closure Project are expected to be a small fraction of those estimates for site-wide activities, as described above For comparison purposes, DOE's annual limit for occupational exposure as a result of all activities and through all exposure pathways is 5,000 mrem (5 rem) per person Natural background radiation in the Denver area results in an annual exposure of approximately 350 mrem per person

Exposures to workers and the public will be controlled and monitored in accordance with the RFETS radiation safety program

8 1 7 Non-Radiological Impacts

Non-radiological health effects (from exposure to chemicals) are measured by a hazard index A hazard index greater than one is considered to be a basis for concern, and the greater the index is above one, the greater the level of concern

For the full suite of site closure activities (including closure of all buildings), a hazard index of 1 2 has been calculated for a co-located worker who is chronically exposed during working hours to all chemicals of concern simultaneously (as described in the CID) over the entire period of site closure The corresponding cancer risk is 5 in 100,000 (CID Section 5 8 3)

For the full suite of site closure activities (including closure of all buildings), a hazard index of 1 5 has been calculated for a member of the public who is chronically exposed every day for 70 years to all chemicals of concern (as described in the CID) simultaneously (a highly unlikely event) A more reasonable scenario of exposure to a single chemical showed hazard indices of well below one for each potentially released chemical, analysis of potentially carcinogenic air pollutants indicates a cancer risk of 3 in 10,000,000 for the maximally exposed off site individual (CID Section 5 8 4)

Estimated non-radiological impacts from the 771/774 Closure Project are expected to be a fraction of those estimated for site-wide activities, as described above Exposures to workers and the public will be controlled and monitored in accordance with the RFETS toxic/hazardous materials and chemical safety program

8 1 8 Occupational Hazards

In addition to exposure to radiological and chemical hazards, workers at the site are exposed to a variety of industrial hazards such as heavy machinery, repetitive motion tasks, and physical agents such as heat and cold Using a general industry rate for construction to estimate injury and illness cases, site closure activities are estimated to result in 584 cases of injury and illness during the peak activity period (1997 - 2006) (CID, Section 5 8 3) The portion of these cases that would be estimated to result from the Building 771 closure alone would be less than the total site figure

The general industry rate of injury and illness is considerably higher than the historic incidence rate for the site, occupational hazards will be controlled, mitigated, and monitored in accordance with the RFETS occupational health and industrial safety programs

8.1 9 Plants And Animals

Because the 771/774 Closure Project is located in the previously disturbed Industrial Area, impacts to plants and animals are expected to be minimal Possible minor impacts to other vegetative areas may result as fugitive dust may distribute undesirable materials among existing plant species Additional impacts may occur to vegetation associated with increased traffic in order to accommodate the closure equipment Increased traffic, both vehicular and pedestrian, could result in some vegetation disturbance

Some of these mammals such as rats, mice, and raccoons are known to be residents of or visitors to the Industrial Area These mammals would be displaced, and some mortality would occur as a result of closure activities Bird nests attached to buildings planned for demolition would be destroyed, although no direct bird mortality is anticipated

8 1 10 Waste Management

Environmental impact issues associated with waste management are related to human health issues, storage capacities, and transportation In general, waste generated from the 771/774 Closure Project includes contaminated and uncontaminated equipment, tools, electrical conduit systems, piping systems, gloveboxes and facility structural materials

Closure activities will be performed to remove radiological contamination and hazardous constituents Items that have been decontaminated to a free release condition will be transferred for use at a different location within RFETS, for use at a different a DOE facility, or sent to the PU&D organization for appropriate handling Mixed waste generated from closure activities will be stored in permitted areas on-site, or where feasible, shipped to an approved off-site disposal site On-site storage of mixed waste will be in accordance with approved site procedures until the material can be shipped for final disposal Hazardous materials and excess chemicals will be managed as waste, where applicable, and disposed of in accordance with established procedures Materials and waste will be characterized, stored and disposed of in accordance with the requirements of approved site waste management procedures that meets state and Federal regulations

Waste minimization will be utilized in the planning and management of the 771/774 Closure Project closure wastes Elimination and reduction of waste generated as a result of closure is a high priority Standard decontamination operations and processes will be evaluated for waste minimization potential and suitable minimization techniques will be implemented

With respect to transportation concerns, the 771/774 Closure Project closure project would generate and package materials suitable to meet DOT transportation requirements

8 1 11 Historic Resources

The environmental impact issue related to historical resources is the loss of Building 771 as a historic structure eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities A related cumulative impact is discussed in a subsequent section

Sixty-four buildings within the site's Industrial Area, including Building 771, have been identified as important to the historic role of the site in manufacturing nuclear weapons components during the Cold War Building 771 was originally constructed in 1951, with a number of additions between 1962 and 1974 While this building, like the others, is less than 50 years old, it is considered historically significant as an essential component of the weapons production activities at Rocky Flats

Negotiations have been completed between DOE and the State Historic Preservation Officer (SHPO) concerning the appropriate mitigative measures applicable to these buildings, Building 771 will be subject only to documentation requirements (collection or creation of construction drawings and photographs), rather than preservation No modification of or damage to the building will occur prior to completion of such an agreement and completion of documentation according to standards accepted by the SHPO

8 1 12 Noise

Closure and demolition of the 771/774 Closure Project are not expected to significantly increase noise levels in the Rocky Flats area Most activities will take place inside the associated building so noise levels, if elevated over ambient levels, will be confined to the 771/774 Closure Project structures in which they are generated Other, less common activities such as scabbling (use of a machine to remove layers of concrete), blasting (use of various materials such as sand, dry ices, or other abrasives to remove surface radiological contamination), and demolition by backhoe ram, hydraulic cutters, or other devices are expected to generate noise levels higher than ambient noise levels However, workers involved in those activities will use appropriate hearing protection devices during activities expected to generate high noise levels Outdoor activities will take place at a distance from unprotected workers and the public and thus are not expected to increase noise levels to these populations to an unsafe level

8 1.13 Socioeconomic Effects

Potential impacts from the 771/774 Closure Project would contribute to a net overall loss of employment in the long run The current on-site work force in the building would either be drawn into the closure activities for the building (and potentially for the entire site) or voluntarily lose employment In the short run, the closure activities could actually increase the employment level due to increased work force levels associated with closure activities Additionally, a modest increase of purchases (raw materials, etc) may result due to closure activities in the short run

Under the worse case scenario, if the entire work force currently housed in the 771/774 Closure Project all opted for voluntarily unemployment, the net overall impact would not have a great adverse effect on the Denver Metropolitan area nor would it adversely effect Boulder and Jefferson Counties, where the majority of the work force reside Taken as a single building, the net effects are expected to be minimal

8 1 14 Cumulative Effects

Impacts associated with the 771/774 Closure Project would contribute incrementally to potential site-wide cumulative impacts associated with the overall site closure program

Some of these cumulative impacts may ultimately prove to be beneficial to the environment, assuming that the activities result, as expected, in the restoration of much of the site's original, natural condition prior to

construction (Remediation is currently scheduled to follow building demolition) Removing human occupation, structures, and paved surfaces and reestablishing native grasses and other vegetation could restore native plant communities and increase wildlife habitat, including threatened and endangered species Cleaning up contamination will reduce health risks to human and animal populations

For other cumulative impacts, including the final remediation phase that will be conducted outside of this project, further study may be warranted As with the 771/774 Closure Project, decontamination and closure of structures site-wide will generate transuranic, low-level, low-level mixed waste, and industrial (landfill) waste Existing on-site interim storage for radioactive waste is limited (DOE/EA-1146), and eventually, as site-wide closure progresses, additional storage capacity may be needed The same is true for industrial waste

Also, demolition of the 771/774 Closure Project is part of a potential cumulative effect to historic resources Demolition will result in the physical removal of a historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities Other historic structures within this district are also proposed for closure and presumed demolition The cumulative effect of these removals may be significant (see mitigation measures below) Also, the collective effect of removing most or all of the structures would be visually dramatic High profile structures that have dominated the site and the local skyline for 45 years would be eliminated The landscape would take on a less industrial and more open, rural appearance, similar to the rangeland that characterized the area before the plant was constructed

8 1.15 Mitigation Measures

Mitigation measures are prescribed to reduce or avoid potentially adverse effects associated with a proposed activity For the decontamination and closure of the 771/774 Closure Project, mitigation measures will be considered in the areas of human health, worker safety, release of emissions and mobilization of contaminants, and cultural resources

Closure will be conducted in accordance with applicable worker and public health and safety programs, activities will be managed so that emissions and discharges are within applicable regulatory limits As required, closure will take place within containment of existing buildings or temporarily constructed facilities (e g , tents) with functioning drainage, air filtration, and other safety and environmental protection systems commensurate with risks inherent in the activities being conducted

Precautions will be taken to ensure compliance with the Migratory Bird Act that prohibits destruction of birds or their nests, active or inactive, without a permit Building surveys for such nests in the 771/774 Closure Project will be conducted prior to demolition

No closure activities will take place in or near habitat of known threatened or endangered species

No modification or damage to buildings determined to be eligible for the National Register of Historic Places will occur prior to completion of the documentation requirements in accordance with the standards set forth in the Memorandum of Agreement with the SHPO

8 1 16 Unavoidable Adverse Effects

The 771/774 Closure Project closure activities, if conducted as proposed, will have the following unavoidable adverse effects

- Physical removal of an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities,
- Short-term increases in air emissions and water discharges,
- Radiation and chemical exposures to workers, co-located workers, and the public, resulting in a small, but increased risk of adverse health effects,
- Possible industrial accidents, resulting in injury and illness, and
- Increased noise levels for the duration of closure activities

8 1 17 Short-Term Uses And Long-Term Productivity

Unlike most projects that commit a Site to a particular use for a period of time, the effect of closure will be to undo past commitments concerning use of the Site and open up a new and broad range of potential future uses Closure does not commit the Site to a particular land use, rather, closure of the 771/774 Closure Project will be one step in the process of ending one use and opening consideration for a variety of other possible future short- and long-term uses

8.1.18 Irreversible and Irretrievable Commitments of Resources

Closure is essentially a destruction project eliminating existing uses, not a construction project consuming land and building materials. The completion of the 771/774 Closure Project will release land and perhaps some buildings for other uses Funds, labor, equipment, fuel, tools, personal protective equipment, waste storage drums, and similar items are resources that will be irretrievably committed to the closure project

8.2 Overall Cumulative Impacts Analysis for RFETS Site Closure

The following is a summary of insights gained from the CID impacts analysis and risk assessments relative to human health, safety, and the environment

- Both the radiological and non-radiological risks to the workers, co-located workers and public as a result of normal operations are lower than during the weapons production years
- Radiological and non-radiological risk to the workers, co-located workers and public as a result of normal operations is minimal and well below the Clean Air Act and EPA standards
- Radiological risk to the workers, co-located workers and public as a result of normal operations is dominated by SNM activities, residue stabilization, and individual facility disposition of the plutonium facilities Once these activities are completed, doses and excess latent cancer fatalities to the workers, co-located workers, and public become insignificant
- For the baseline case, radiological accident risks dominate the overall risks to the workers, co-located workers and public However, of the closure case, risks to the workers, co-located workers and

public are initially dominated by radiological accident risks, until around 2006, when residue stabilization, SNM consolidation activities, and initial deactivation efforts that remove or fixate holdup are completed Then the risks are dominated by normal operations involving the individual facility disposition process and environmental restoration as the plutonium buildings' nuclear ventilation systems go through the individual facility disposition process

- Probability of a seismic event contributes over 90% of the risk to the co-located worker, maximally exposed off-site individual, and 50 mile population for both overall baseline case accident risks and to the overall closure case accident risk during the peak year

The following closure operations and activities contribute the most to reducing the risk of accidents caused by seismic events and thereby overall accident risk to the workers, co-located workers, and public in the following order of priority based on the projected schedules

- consolidating plutonium oxides into building 371,
- repackaging the dispersible residues into the pipe/drum component or storing in building 371,
- removing plutonium hold-up
- shipping TRU/TRM waste drums to WIPP,
- transferring SNM from building 371 to the ISV or shipping off-site,
- shipping other TRU/TRM waste to WIPP, and shipping LL/LLM waste off-site

The CID provides a comparative summary of the two cases in terms of the expected environmental impacts The following are some insights gained from the ecological risk assessments and impacts analysis relative to the environment

Short-term impacts on wetlands, sensitive habitats, wildlife, and species of special concern may occur as a result of extensive site closure activities There is, however, no natural resource injury expected Closure activities are not expected to result in the irretrievable or irreversible commitment of any natural resources of the site Closure activities will be evaluated in light of the potential for natural resource injury and applicable mitigation measures will be taken to minimize the potential for natural resource injury to the extent practicable

The closure case anticipates use of a flow-through water management system for on-site water management ponds and then the eventual conversion of the ponds to wetlands This action may initially reduce the open-water habitat on the site by created by the water management ponds, but as the ponds are converted to wetlands, wetland species diversity would increase and overall biodiversity at the site would be improved over the long term All other on-site environmental impacts are considered low for both cases and no natural resource injury is expected

Cumulative impacts are impacts on the environment resulting from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions carried out both by the federal agency and other entities within the geographical region Significant impacts could result from several smaller actions, that, by themselves, may not have significant impacts Cumulative impacts associated with either case and any potential developments in the region of the site would include

- Increased surface runoff and decreased groundwater discharge because of the use of on-site landfill or CAMU caps
- Short term impacts to wetlands habitat, riparian habitat, open water habitat, aquatic habitat, native grasslands communities, and species of special concern However, once the water management ponds are converted to wetlands, biodiversity is expected to increase
- Minor cumulative impacts to surrounding land uses primarily along state routes and local roadways
- Increased traffic volume resulting from off-site shipments of Pu Pits and wastes potentially causing congestion problems
- Increased traffic accidents resulting in fatalities, and potential latent cancer illnesses related to motor vehicle emissions, fugitive dusts, and brake/tire wear
- Socioeconomic impacts from reductions in the site's workforce will not substantially affect surrounding region due to additional growth projected in the area

Overall, substantial cumulative impacts are not anticipated from the closure of Building 771

9. Quality Assurance Strategy

9.1 Background

The work to be performed under this Plan must be accomplished in accordance with regulatory and contractual Quality Assurance requirements that are common to nuclear facilities across the DOE complex The regulatory document is 10 CFR 830 120, *Quality Assurance Requirements* (the Price-Anderson QA rule) The contractual document is DOE Order 5700 6C, *Quality Assurance* The technical requirements are embodied in ten criteria, which are virtually the same in both documents The difference between the two documents is scope and enforceability 10 CFR 830 120 applies to activities which have the potential to cause radiological harm, and is enforceable under Price-Anderson, DOE Order 5700 6C applies to non-nuclear activities, and is a contractual obligation

The level and intensity of application of these requirements to a facility that is undergoing project closure will diminish as the facility moves closer to the final project endpoint The purpose of this plan is to provide strategic principles and guidance on the graded application of QA requirements to a facility undergoing project closure, where the safety significance of activities and the magnitude of risk associated with the facility are decreasing over time

Neither 10 CFR 830 120 nor 5700 6C are imposed directly on SSOC facilities and activities These two documents require that contractors prepare Quality Assurance Plans (QAPs) which define how the contractor will implement the ten criteria for its scope of work Once approved, these QAPs become the basis for regulatory or contractual compliance

The Kaiser-Hill Team QAP, approved by the DOE, addresses both 10 CFR 830 120 and 5700 6C SSOC has separate QAPs for 10 CFR 830 120 and 5700 6C, both of which have been accepted by the IMC

9.2 Quality Criteria

The objective is to apply quality assurance requirements in a cost-effective manner in such a way that the levels of control and assurance remain appropriate for the decreasing magnitude of risk associated with the facility

What follows is a discussion of each of the 10 criteria of the QA rule (10 CFR 830 120) and DOE Order 5700 6C A comment section is included, articulating guiding principles and examples for reducing the formality and intensity of application of quality requirements towards the end of the 771/774 Closure Project life

Quality Criterion	Procedure Which Implements/Satisfies The Criterion
1) Quality Programs	SSOC QAPP for 10 CFR 830 120 SSOC QAP for DOE Order 5700 6C Site Quality Assurance Program Criteria Document SSOC Quality Assurance Policy Preparation of QA Plans

Management Control system

Comments The requirement is that roles, responsibilities, interfaces be identified and maintained in a Quality Assurance Program The QA rule and 5700 6C allow contractors wide latitude in selecting the appropriate quality standards and levels of control, based on factors such as the form and magnitude of the (remaining) hazard, the life cycle stage of the facility, and the mission of the facility As the scope and risk decrease during the closure process, the level of rigor and intensity of quality requirements may be adjusted and implemented via revisions to the applicable QA Program documents and implementing procedures Organization charts and charters may be used to identify roles and responsibilities, instead of continuing to revise procedures to accommodate changes in scopes of work

2) Personnel Training and Qualification	Training User Manual Training Implementation Matrix SSOC Training Program Plan

Comments The referenced programs identify the positions that require formal qualification and certification (and continuing training) for the 771/774 Closure Project A graded approach allows all but certified positions to maintain qualification by continued satisfactory performance in their assigned jobs, stretches out the intervals for re-certification, and reduces (if not eliminate) the requirements for continuing training

3) Quality Improvement	Quality Improvement Process Commitment Management and Corrective Action Process Control of Non-conforming Items Occurrence Reporting Process SSOC Lessons Learned Cause Analysis

Comments As the facility moves into closure, a graded approach allows actionees to manage all but the most significant corrective actions in PATS, rather than via the NCR process It also removes from the NCR program all systems, components, and structures that have been declared out-of-service, permits engineers to disposition all but "accept as-is" dispositions on vital safety system components, and allows designated facility personnel to validate NCR implementation without independent verification

4) Documents and Records	Document Control Program Records Management Guidance

Comments Some level of controlled documentation will be required until the end of the 771/774 Closure Project The number of controlled copyholders will be drastically reduced as the project nears completion The procedures will identify the QA records that are generated as a result of implementing each procedure

5) Work Processes	Configuration Change Control Program Integrated Work Control Program Manual Procedure Process Procedure Writing Conduct of Operations Manual Control of Processes

Comments Procedures associated with the 771/774 Closure Project activities will need to be maintained and controlled until the end of project life The number of independent reviewers/approvers will be significantly reduced, and should consist of project line personnel, except for vital safety systems

6) Design	Conduct of Engineering Manual Computer Software Management Manual SSOC Plant Review Committee SSOC USQD Process Configuration Change Control Program

Comments Sufficient engineering design control will need to be maintained to ensure that personnel can safely enter and work in the facility, and that safety-significant systems, components, and structures (including engineered safety features) will function as intended The general level of engineering verification and validation associated with engineering activities will be significantly reduced as the project comes to closure Peer reviews and one-over-one management reviews should be the norm

7) Procurement	Procurement System Manual Acquisition Procedure for Requisitioning Commodities and Services

Comments Special procurement control should be limited to components and services for vital safety systems Towards the end of the 771/774 Closure Project, virtually all procurements should be commercial buys, not requiring suppliers to have special quality programs or to provide documentation beyond that which comes with the item as a matter of course

8) Inspection and Acceptance Testing	Inspection Control of Measuring and Test Equipment Identification and Control of Items

Comments Calibration of plant-installed instrumentation should be limited to those instruments associated with demonstrating compliance with the facility authorization basis (e g , LCO surveillances), those necessary to operate safety systems, and those necessary to demonstrate acceptance criteria for closure activities Calibration intervals may be extended, and control of instruments requiring calibration may be by lists of instruments in lieu of labels on individual instruments

9) Management Assessment	SSOC Management Assessment Program

Comments Towards the end of the 771/774 Closure Project, most of the assessments in the facility will be management assessments (versus independent assessments), and the level of assessment activity will be significantly reduced The last large-scale assessment activity should be a Project Closure review, to confirm that the required steps have been completed

10) Independent Assessment	Independent Assessment Program Planning and Scheduling Independent Assessments Conduct of Independent Assessment Activities

Comments As the project approaches closure, the level and intensity of independent assessment diminish during the last year, the requirements may be satisfied by an annual assessment covering remaining safety-related activities At some point near closure, no further independent assessments will be scheduled or performed limited-scope facility-specific surveillances performed by QA representatives assigned to the facility would continue until shortly before final closure

10. Project Organization

The following sections are provided for information purposes only The site can change this information as necessary to support the goals of the project without regulatory approvals Details on how this project fits into the larger D&D efforts can be found in Section 4

10.1 Application of Project Control to Subcontractors

The scope, schedule, and budgets for subcontracts will be defined in accordance with the project plan The subcontractor's scope, payment line items, and reports will be required to be structured in accordance with the WBS so that subcontractor planning and reporting can be integrated into the project management and control system Monthly reports giving the Actual Cost of Work Performed (ACWP) and other cost elements (Budgeted Cost of Work Scheduled (BCWS) and Budgeted Cost of Work Performed (BCWP)) will be required from each subcontractor Each subcontractor will be required to use the same or compatible scheduling software and systems

10.2 Work Breakdown Structure

The project schedule is developed by assigning scope descriptions to all required strategic plan activities in the Work Breakdown Structure (WBS) Each activity has a budget and schedule that is jointly prepared by the IMC, DOE and appropriate subcontractors It incorporates knowledge of the rest of the site infrastructure activities, constraints from plant conditions, and other activity interactions All of the activities are then assembled into the master schedule called the Closure Project Baseline (CPB) The CPB is used to direct and manage site contractor and subcontractor work efforts and is the basis for current year and outyear budgeting, planning, and schedule reporting The Project Baseline Summary (PBS), which provides a three-year look-ahead of the project, is approved yearly by DOE

The proposed WBS for Building 771/774 Closure Project is shown in Table 10-1

Each WBS element is supported by a listing of the type of personnel required, their average labor rate, the duration of each individual's contribution, costs of support equipment and services, travel requirements, etc Also included is a detailed description of the task and a list of any assumptions made and describes unusual activities that affect cost These are detailed in the RFETS Closure Project Baseline As the project matures, the cost data will be assigned to cost accounts and used as the performance baseline

The WBS includes an appropriate level for planning, budgeting, and controlling each project and provides the basis for all program planning, operation, and management The WBS index and dictionary are site-controlled documents that describe the work that will be accomplished within each element Changes to the WBS will not be updated in the DOP

Table 10-1 WBS Activity Listing for Bldg. 771/774 Closure Project

WBS Element Number	Activity
1	The Site Vision Achieved
1 1	Achieve Intermediate Site Condition
1 1 06	Release Nuclear Production Zone
1 1 06 10	Remove 771/774 Cluster
1 1 06 10 01	Cluster Landlord Functions
1 1 06 10 01 01	771/774 Compliance
1 1 06 10 01 02	771/774 Maintenance
1 1 06 10 01 03	771/774 Operations Technical Support
1 1 06 10 01 04	771/774 Operations Management
1 1 06 10 01 05	Authorization Basis - BFO
1 1 06 10 02	771/774 Cluster SNM Removal Operations
1 1 06 10 03	771/774 Cluster Deactivation
1 1 06 10 03 71	Building 771 Deactivation
1 1 06 10 03 71 XX	Set XX - Work Set (typical)
1 1 06 10 03 74	Building 774 Deactivation
1 1 06 10 03 74 XX	Set XX - Work Set (typical)
1 1 06 10 04	771/774 Cluster Decommissioning
1 1 06 10 04 71	Building 771 Decommissioning
1 1 06 10 04 71 XX	Set XX - Work Set (typical)
1 1 06 10 04 74	Building 774 Decommissioning
1 1 06 10 04 74 XX	Set XX - Work Set (typical)
1 1 06 10 05	771/774 Cluster Closure
1 1 06 10 06	Remediate/Contain 771/774 Cluster High Risk IHSS
1 1 06 11	Remove 771A Cluster
1 1 06 11 03	771A Cluster Deactivation
1 1 06 11 03 71	Building 771A Deactivation
1 1 06 11 03 71 XX	Set XX - Work Set (typical)
1 1 06 11 04	771A Cluster Decommissioning
1 1 06 11 04 71	Building 771 A Decommissioning
1 1 06 11 04 71 XX	Set XX - Work Set (typical)
1 1 06 11 05	771A Cluster Closure
1 1 06 11 06	Remediate/Contain 771A High Risk IHSS

10.3 Schedules

All work performed at RFETS is scheduled and integrated by inclusion in a controlled master resource loaded Critical Path Method (CPM) schedule, referred to as the Closure Project Baseline (CPB) Schedule The schedule includes all work scope required to initiate, plan, execute, and closeout the project using activities tied to the approved site WBS and is tiered in accordance with the WBS The coding structure conforms with the site coding standards to allow integration of individual schedules into the master CPB schedule The total life cycle of a project is scheduled, however, near-term work may be in greater detail than outyear work The CPB is based on current assumptions, which may change as additional technical information is acquired

The CPB is the basis against which planning and project performance will be evaluated A cost and resource loaded schedule allows the evaluation of planning alternatives as they relate to funding and resource constraints, while permitting the schedule to maintain a logical sequence of activity execution

The CPB will be used to direct and manage RFETS contractor and subcontractor work efforts and is the basis for current year and outyear budgeting, planning and schedule reports, both internal and external (DOE, EPA, CDPHE, Stakeholders, etc) Status against the CPB will be reported at least monthly and updated as required

The equipment removal portion of the schedule is combined into the scheduling system that is structured to provide management with an integrated scheduled baseline for managing the task and reporting progress It consists of a hierarchy of related levels of schedules with each succeeding lower level more fully detailing the specific tasks required to meet project requirements

Special schedules will also be prepared for special studies A typical special schedule is the project activity schedule, which will be prepared each week to display day-to-day events, thus ensuring overall project awareness Detailed schedules, including weekly work plans and 60/90-day "look-ahead" schedules, can also be derived from the project summary schedule

10.4 Budget

10.4.1 Work Authorization Document

The Work Authorization Document (WAD) is the level at which authority delegation begins, work is budgeted, and activity is monitored and measured against project plans The WBS elements contain all WADs for the work to be performed by the functional groups within the project Each WAD may be subdivided into activity planning packages tracked by the expenditure of job labor hours and labor dollars, material dollars, subcontract costs, or other direct costs WADs are uniquely identified so that any resources budgeted, committed, or used can be directly traced to the specific WAD Thus, this feature will facilitate planning, controlling, and measuring work

Each Work Authorization Document will contain activity planning packages that will constitute the fundamental unit for planning, budgeting, authorizing effort, and measuring performance at the level where the work is accomplished One person is responsible for each planning package, which will be uniquely identified

10 4 2 Budgeting

Individual activity planning package budgets will be prepared based on a project specific scope, schedule, cost estimate, and WBS The budgets will be based on estimates of labor, equipment, materials, subcontracts, and all other direct and indirect costs to the WBS level and will include the level of detail required for effective project planning and control The Performance Measurement Baseline (PMB) will incorporate all WADs and will be the benchmark against which project cost and schedule performance will be measured Once the PMB is established, all changes to it are controlled via the site change control process

Budgets will be developed at the activity package level and will use control points/milestones to define the accomplishments and deliverables of a work package Control points or milestones are an integral part of the project schedule They indicate the delivery of a product, declare the completion of a project phase, or document the collection of information necessary to make a key decision Project/task specific Table of Values will be developed to correlate the earned value of work completed or Budgeted Cost of Work Performed (BCWP) to the Budgeted Cost of Work Scheduled (BCWS)

10 4 3 Work Authorization

Work Authorizations (WA) define the goods and services needed to accomplish work and serve as the mechanism to initiate task execution Work is defined in terms of a task specific scope of work to be performed with clearly understood and agreed upon deliverables, schedule, and estimate/budget Work is assigned to qualified parties to plan, execute and control all task/projects in accordance with plant policies/ standards and good business practices Information within the WA provides the basis for detailed task planning, progress monitoring, contract milestones, schedule milestones, and WAD codes

10 4 4 Cost Schedule and Change Control

All measurements of progress and performance will be compared with the baseline plan to identify deviations from the plan The baseline plan will remain unchanged throughout the life of the project unless a replanning process (contract change orders) changing or altering the project scope is authorized by DOE Change orders are changes to the project for items outside the current scope of work authorized by DOE for inclusion in the contract, changes may be directed by DOE or requested by the PM

10.5 Performance Measures

10.5 1 Cost/Schedule Performance Measures

Budgets and schedules will be tracked directly and consistently with the accomplishment of work, so that progress measurement is more than a simple measurement of spending rate An earned value methodology will be used to measure performance

Three types of variances will be monitored schedule, cost, and "at completion " Cumulative-to-date and incremental variances will be evaluated monthly

A schedule variance (SV) occurs when BCWP differs from BCWS If BCWP is less than BCWS, then less work has been done than was planned and the schedule variance is unfavorable It will be the responsibility of the Project Controls manager to analyze the schedule variance and determine actual schedule status with regard to cost account milestones, possible impact on higher-level milestones, and appropriate corrective action

A cost variance (CV) occurs when BCWP varies from actual cost of work performed (ACWP) A negative cost variance (BCWP - ACWP) indicates an unfavorable cost status, it does not necessarily indicate a cost overrun, but it does indicate the potential for a cost problem

10 5 1 1 Information & Reporting Systems

Cost account managers will perform variance analysis, which will include identifying the cause of the variance, determining its impact and proposing corrective action At the end of each accounting month, Project Controls will provide the PM with summaries of BCWS, BCWP, and ACWP for each cost account and WBS element and CVs and SVs for WBS elements If the variance exceeds thresholds established, the Project Controls organization will initiate a variance analysis report (VAR) to the Closure Program Manager and Project Manager for review and resolution

The PM will have the overall responsibility for the Estimate at Completion (EAC), and the Project Controls Supervisor will be responsible for coordinating the preparation of the EAC forecasts for cost accounts or functional organizations The forecast process will consider the following

- Actual cost and performance to date
- Projections of "to go" cost based on work scope
- Anticipated problems, escalation, and resources
- Subcontract performance and progress

Project Controls will prepare a monthly report to provide cumulative costs by WBS element for BCWS, BCWP, ACWP, SV, CV, BAC, and EAC Project Controls will also provide variance analyses when CVs exceed contract thresholds The internal reporting systems will be structured to gather information on project status for all levels of management

The monthly project status, cost management, schedule status, and cost performance reports will be produced directly from the project control system The milestone schedule and status report will be updated monthly with information derived from the project summary schedule and project milestone schedule for all WBS items, contract milestones, and deliverables

Monthly cost performance reports will show current and cumulative budget, actual costs, and earned value data by WBS element They will identify cost and schedule variances and compare the EAC with the budget In addition, the performance measurement baseline will be updated to report DOE-authorized contract changes

10 5 2 Activity-Based Performance Measures

Activity-based Performance Measures will be determined and agreed upon by the Integrating Management Contractor, DOE-RFFO and the appropriate subcontractor These Performance Measures are linked with the phased approach, and focus progress on accomplishing the overall strategic endpoints, and well as set-specific end-points Initial Performance Measures (FY 1998) are expected to include

a)	Drain SNM Liquids in B771	12/31/97
b)	Remove Existing Residue Drums from 771 Annex	12/31/97
c)	Drain 38 Systems of B771 SNM Liquids	9/30/98

d)	Remove Remaining Packaged Residues (55 Gallon Drums and Those Not in 55 Gallon Drums as of October 1, 1997 from 771)	9/30/98
e)	Complete SNM Hold Up Characterization in B771	9/30/98
f)	Remove 2000 sq ft Benelex from B771	9/30/98
g)	Remove Cold Glovebox Line 30 from B771	9/30/98

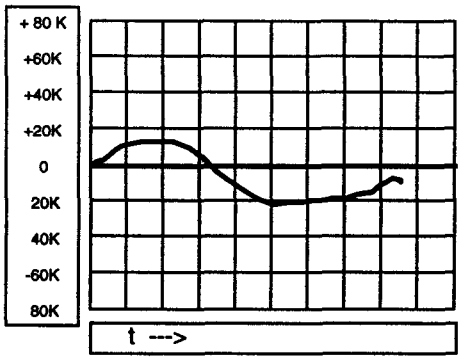
10.6 Performance Metrics

A set of metrics will be tracked to ensure adequate performance within the scope of this plan These metrics, determined by the Project Manager, may include the following data

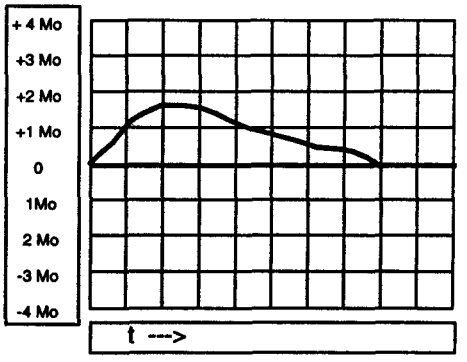
- Expected Project Finish
- Estimated Final Cost
- Quick Performance Index
- (% budget spent/% project complete)
- Cost/Schedule variance
- ((BCWP-ACWP)/BCWP)*100 vs ((BCWP-BCWS)/BCWS)*100
- End Points Progress
- Number of completed work sets

Other Performance Metrics will be generated as necessary to effectively monitor progress Sample metrics are shown on the next page

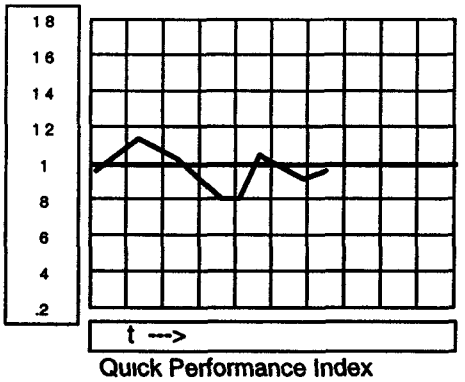
Figure 10-1 Examples of Performance Metrics



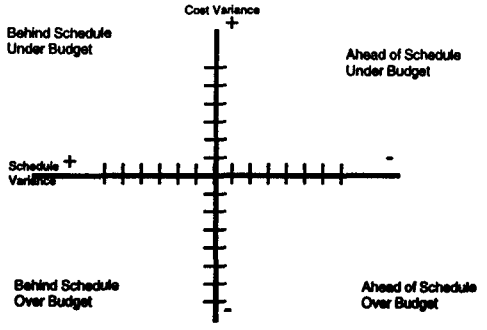
Estimated Final Cost



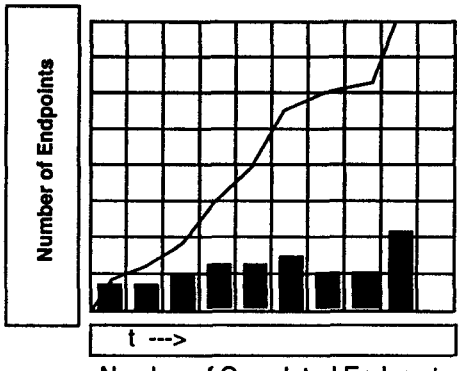
Estimated Project Finish



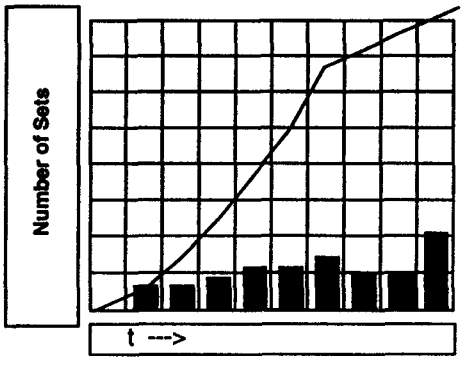
Quick Performance Index
% Budget Spent/% Project Complete



Earned Value
Cost & Schedule Variances



Number of Completed Endpoints



Number of Completed Equipment Sets
Cumulative
completed

10.7 Organization Structure

10 7 1 Internal Organizations

The management approach of the Closure Project provides for easily maintained schedule and cost controls These controls assist the project manager to ensure that the targeted costs and schedule are met The real-time controls identify changes as requirements dictate -- not when the end of the milestone/project is reached, and costs have already exceeded the target This approach provides a format to meet DOE's philosophy, which puts worker safety first, constructs outcome-oriented projects, provides better management and control of finances and focuses technology

The general responsibilities for the internal organizations are as follows

Organization	Responsibilities
DOE	Enforcement of government regulations
	Communications with site external organizations regarding the closure program
	Oversight of Closure Operations
	Communications with IMC of external and RFFO inputs, including funding and overall direction
	Interfacing with other regulatory agencies, stakeholders, and the public
Integrating ManagementCompliance with government regulations	
Contractor (IMC)	Communications with DOE-RFFO regarding closure program status
	Integrated management of the closure program including program and subcontractor funding and guidance
	IMC will approve and forward the appropriate documents to DOE-RFFO
	Project Direction
Subcontractors	Compliance with government regulations
	Communications with IMC regarding the performance and status of the closure program
	Demonstrating that alternate methods of performing closure activities comply with regulatory requirements
	Performing closure activities and submittal of the closure documentation
	Project Management

10 7.2 External Organizations

The external organizations with major interests in the site closure have prepared a MOU- Memorandum of Understanding Governing Regulation and Oversight of Department of Energy Activities in the Rocky Flats Environmental Technology Site Industrial Area A summary of those interests is presented here, but refer to the MOU for further clarification of the responsibilities of DOE, DNFSB, EPA, and CDPHE

Organization	Responsibilities
Colorado Dept of Public Health and Environment (CDPHE)	Regulatory oversight of RCRA related activities
Defense Nuclear Facilities Safety Board (DNFSB)	Independent oversight of all activities affecting nuclear safety
Environmental Protection Agency (EPA)	Enforcement of environmental laws not delegated to the State of Colorado

10 7.3 Organization / Resources

Program management and control will function under an integrated scope, schedule, and cost control system that identifies responsibilities and interfaces This control system is described in Volume 3 of the Conduct of Engineering Manual Planning and estimating practices are described in the Business Management and Integration document, "Standards and Process Flow Diagram" The project organization, under the direction of a project manager, is an integrated team of qualified individuals for each project

This team will consist of personnel from a number of the K-H team subcontractors, although primarily from SSOC and RMRS A teaming agreement is underway with SSOC, RMRS and K-H to facilitate a seamless evolution through the various stages of the closure project Developed as part of the major reengineering project on site, this arrangement will maximize the core competencies of the major subcontractors, maximize the efficiency of the available work force and improve safety of the workers

The organizational structure illustrated in Figure 4-1 is based on harvesting good ideas from the hard lessons learned from Hanford PUREX, Hanford Tank Farms, Three Mile Island, and Fort St Vrain, and also from the suggestions of the 771 re-engineering team The organization is tailored to the size and complexity of the project

The operations centric structure and the project centric structure represent natural stages of evolution that are appropriate as the building activities change from a pure operations activity, such as tank draining, to pure facility closure The organization represented by Figure 10-2 is designed to safety and efficiently achieve the pure closure project goals

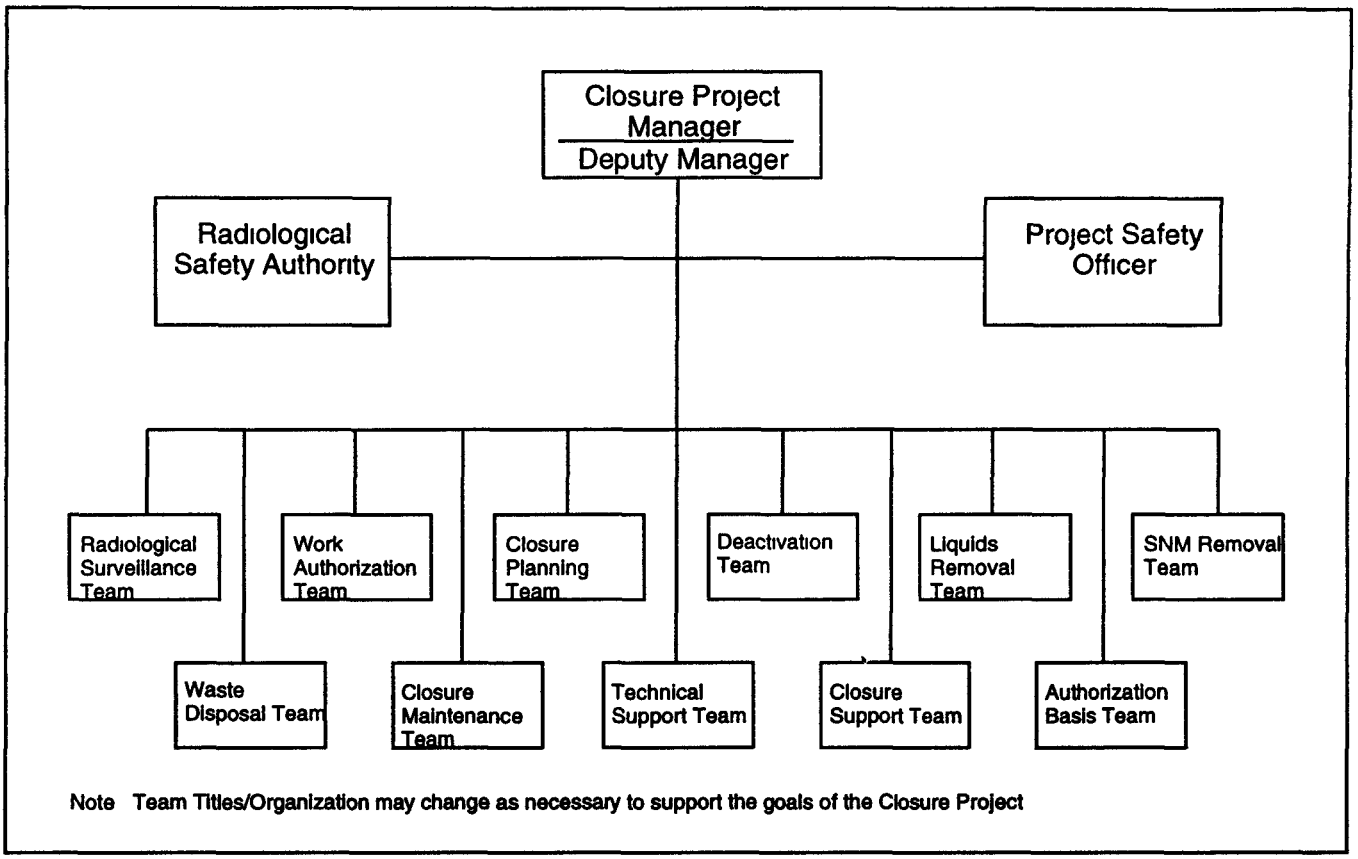


Figure 10-2 Organization Structure

The detailed roles and responsibilities of the positions are included at the end of this section, but in brief, there is a clear line of responsibility from the integrator to the closure project manager, through the work release manager, to the execution project managers, and finally to the enhanced worker teams

- The Closure Project Manager is the senior leader of the closure project and has the responsibility to set expectations for performance, establish principles of behavior, and provide the primary senior external interface for the closure project
- The Work Authorization Team Leader is the focal point who maintains the safety and regulatory envelope for the project This person provides the primary external interface to the site-level safety and regulatory direction and is the link to the conduct of operations improvement It provides the project constraints to the Project Execution Managers and then gives the day to day authorization to proceed with work similar to the function currently provided by a shift manager
- The Closure Planning Team Leader is the primary interface to external organizations that are working on the Protected Area execution plan and the Ten Year Plan Within the closure project this person has the responsibility to maintain the project closure plan and to coordinate the distributed planning resources that are under the direct wing of the Project Execution Managers The plan includes the entire closure project, the three year plan, as well as the annual, monthly, and weekly plans The

resource needs must be projected to allow adequate time for the Technical Support Manager to acquire the resources for distribution to the Project Team Leaders

- The Project Team Leaders are an extremely important function It is "where the rubber meets the road" on executing the defined project work scope The work scope definition comes from the Project Integration Manager For example, a Project Team Leader would be assigned to glovebox removal or to excess equipment removal
- The Technical Support Manager is responsible for filling a number resource needs of the Project Team Leaders as predicted by the Closure Planning Team Leader These resources include all technical aspects including Nuclear Safety, Criticality Safety, Environmental Safety, Engineering, etc This person is the focal point for setting resource priorities The Closure Project Manager sets the absolute Priorities
- The Enhanced Worker Teams are teams that have the self contained resources to complete the assigned project activity Some resources would be temporarily assigned to the activity, however, it is the responsibility of the Technical Support Manager to assure that the necessary external resources are provided at precisely the right time There will be several modes of self direction depending upon the team experience This includes self identification of hazards in the spirit of 95-2 Specific resources required are detailed as part of the resource-loaded schedule

10 7 4 Position Descriptions

Below are the detailed position descriptions for the project team positions

Closure Project Manager

Role

Senior leader of the closure project

Responsibilities

Provide the leadership for the closure project

Set expectations for performance in the following areas

- Worker and public safety
- Regulatory compliance
- Cost and schedule
- Performance improvement

Establish principles of behavior (Teamwork, Participation, Determination, Recognition, Integrity, Caring, etc)

Provide the primary senior external interface for the closure project (IMC, contractors and external organizations such as Defense Nuclear Facility Safety Board, State, etc , as needed to support the IMC and DOE)

Attributes

Strong people leadership skills

Demonstrated principles behavior

Excellence in diplomatic interfacing

Strength in communications and presentations

Core competency in project management

Core competency in nuclear operations

Deputy Manager

Role

Second in command for the closure project

Responsibilities

Act for the closure project manager in his or her absence

Provide the day to day leadership for the Project Activity Managers

Manage the Self Assessment and Performance Improvement Programs

Attributes

Strong people skills

Demonstrated principled behavior

Strength in communications

Core competency in project management

Core competency in nuclear operations

Work Authorization Team Leader

Role

Line management authority to grant work release to compliant project activities

Responsibilities

Provide the line management linkage to the site manuals, standards, requirements, and procedures

Provide the linkage to the company operations excellence initiatives

Maintain the authorization basis for the project including definition of the worker safety, public safety, and environmental regulatory envelopes for the project activities

Grant work releases for execution of project activities

Provide the support to the Integration Manager to help define the end points and the logical sequencing of end points to reduce the controls and the mortgage cost

Attributes

Demonstrated principled behavior

Core competency in nuclear operations

Deep understanding of authorization basis

Understanding of project management

Familiarity of the facility

Closure Planning Team Leader

Role

Lead the closure project planning and integration

Responsibilities

Provide the bottoms up link and support to the Protected Area Execution Plan

Develop and maintain the closure project plan

Define the end state requirements

Define the work scope for the Project Team Leaders

Develop and maintain the project documentation

Provide the training in project management skills

Provide the project tools and processes

Provide the required technology

Project the project resource requirements

Define the project issues and assign responsibilities for resolution

Manage the incubation of future project activities

Attributes

Strong people leadership skills

Demonstrated principled behavior

Core competency in project integration and planning

Experience in project management

Understanding of nuclear operations

Project Team Leader

Role

Line management execution of project work scope

Responsibilities

Achieve the end state of the project activity on cost and schedule

Manage the activity maintaining worker and public safety and without any environmental issues

Manage the enhanced worker teams

Define the bounds of their safety envelope

Ensure that they meet the intent of 95-2

Provide mentioning and training

Resolve issues

Monitor and evaluate

Career path

Redeploy resources

Provide access to special expertise

Conduct salary planning

Recognize successes

Attributes

Strong people leadership skills

Demonstrated principled behavior

Core competency in project execution

Fundamental understanding of safety envelopes

Appendix 1 References

"Building 771 Walkdown Report", Draft, Rev 1 3, 8/29/96

BDP-771-001, "Building 771 Cluster Initial Project Scope,", Revision 0, July 24, 1996

Combining Integrated H&S Strategy with Enhanced Work Planning An implementation approach for PUREX facility, 10/29/96

Conduct of Engineering Manual

Conduct of Operations Manual

Configuration Change Control Program Manual

DOE /EM-0246, Closure Resource Manual, 8/15/95

DOE/EH-0486, Integrating Safety & Health During Deactivation with Lessons Learned from PUREX, 9/29/95

DOE/EM-0318, Facility Deactivation Guide, 12/01/96

Final Rocky Flats Cleanup Agreement, 7/19/96

Health and Safety Practices Manual

Integrated Work Control Program Manual

Management Plan for Material Contained in Idle Equipment

MOU Governing Regulation and Oversight of DOE Activities in the RFETS Industrial Area, 2/15/96

RCRA Closure Plan for Mixed Residue Container Storage Units

SSOC Quality Assurance Program

SSOC Quality Assurance Program Plan

Waste Stream and Residue Identification and Characterization, Building 771

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Appendix 2 Definitions/Acronyms

DEFINITIONS

Closure Takes place after deactivation and includes surveillance and maintenance, decontamination, and/or dismantlement These actions are taken at the end of the life of the facility to retire it from service with adequate regard for the health and safety of workers and the public and protection of the environment For those buildings in which no deactivation occurs, the term includes characterization as well as the above activities The ultimate goal of closure is unrestricted release, or if unrestricted use is not feasible, restricted use of the site

Deactivation The process of placing a facility in a safe and stable condition to minimize the long-term cost of a surveillance and maintenance program that is protective of workers, the public, and the environment until closure is complete Actions include the removal of fuel, draining and/or de-energizing of non-essential systems, removal of stored radioactive and hazardous materials and related actions As the bridge between operations and closure, based upon facility-specific considerations and final disposition plans, deactivation can accomplish operations-like activities such as final process runs, and also decontamination activities aimed at placing the facility in a safe and stable condition Deactivation does not include decontamination necessary for the dismantlement and demolition phase of closure, i e , removal of radiological contamination remaining in fixed structures and equipment after deactivation Deactivation does not include removal of contaminated systems, system components, or equipment except for the purpose of accountability of SNM and nuclear safety It also does not include removal of radiological contamination except as incidental to other deactivation or for the purposes of accountability of SNM and nuclear safety

Decommissioning: All activities which occur after deactivation It includes surveillance, maintenance, decontamination, and/or dismantlement, for the purpose of retiring the building from service with adequate regard for the health and safety of workers and the public and the protection of the environment

Decontamination: The removal or reduction of radioactive or hazardous contamination from facilities, equipment, or soils by washing, heating, chemical or electrochemical action, mechanical cleaning or other techniques to achieve a stated objective or end condition

Dismantlement The disassembly or demolition and removal of any structure, system, or component during closure and satisfactory interim or long-term disposal of the residue from all or portions of the facility

End-Point Criteria The defined objective(s) or goal(s) that represent the agreed upon facility condition to be achieved during the closure process

Enhanced Work Planning (EWP) EWP is a process that evaluates and improves the program by which work is identified, planned, approved, scheduled, coordinated, controlled, and executed

Facilities Buildings and other structures, their functional systems and equipment, and other fixed systems and equipment installed therein, outside plant, including site development features such as landscaping, roads, walks, and parking areas, outside lighting and communication systems, central utility plants, utilities supply and distribution systems, and other physical plant features

Graded Approach A process that assures safety analysis and documentation preparation is commensurate with the magnitude of the hazards being addressed and the complexity of the facility and/or systems being relied on to maintain an acceptable level of risk

Hazard A source of danger (i e , material, energy source, or operation) with the potential to cause illness, injury, or death to personnel, or damage to a facility or the environment without regard for the likelihood or credibility of accident scenarios or consequence mitigation

Job Hazard Analysis An analysis of procedurally controlled activities that uses developed procedures as a guide to address and consider the hazards due to any exposures present during implementation of (job) procedures, the use and possible misuse of tools and other support equipment required by the procedures, and the behavioral motivations of the people performing them A type of hazard analysis process which breaks down a job or task into component steps, examines each step to determine what hazard(s) exist or might occur, and establishes actions to eliminate or control the hazard

Safety Analysis Report (SAR) A report that documents the adequacy of safety analyses for a nuclear/non-nuclear facility to ensure that the facility can be constructed, operated, maintained, shut down and decommissioned safely and is in compliance with applicable laws and regulations

Safety and Health As defined in this report, a conditional state in which both the public and workers are free from harm It is also defined as the practice and application of techniques to help prevent illness, injury, death and property loss as a result of unintentional and undesirable conditions and acts

Safety Authorization Basis The combination of information relating to the control of hazards at a facility (including design, engineering analyses, and administrative controls) upon which DOE depends for its conclusion that activities at the facility can be conducted safely

Safety-Critical Items Equipment, systems, or components that are necessary to prevent or mitigate the harmful consequences of hazardous materials release

Standards. As defined by the Department's Standards Committee, standards include "Federal, state, and local laws and regulations, Department Orders, nationally and internationally recognized standards, and other documents (such as industrial standards) that protect the environment and the safety and health of our workers and the public "

Surveillance and Maintenance (S&M) A program established during deactivation and continuing until phased out during closure to provide containment of contamination, physical safety and security controls and maintenance of the facility in a cost-effective manner that is protective of workers, the public and the environment

Unreviewed Safety Question (USQ) A process to allow contractors to make physical and procedural changes and to conduct tests and experiments without prior DOE approval as long as the changes do not explicitly or implicitly affect the safety authorization basis of the facility It also requires that issues with a potential impact to the safety authorization basis be brought to the attention of DOE

USQ Screening Process A technique/tool that uses a checklist approach to help determine if suggested changes require a full USQ determination of any effect on the safety authorization basis of the facility

Work Task A discrete activity made up of procedures performed in steps to achieve an objective goal such as removal of plutonium from gloveboxes, removal of a chemical from a storage area or removal of asbestos from a facility area

ACRONYMS

AB	Authorization Basis
ACE	Activity Control Envelope
ACM	Asbestos Containing Material
ACBM	Asbestos Containing Building Material
ACWP	Actual Cost of Work Performed
AHA	Activity Hazard Analysis
ALARA	As Low As Reasonably Achievable
Ar	Argon
ARF	Administrative Record File
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
BFO	Basis for Operations
BRCS	Building Radiation Cleanup Standard
cc	cubic centimeter
CAMU	Corrective Action Management Unit
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CID	Cumulative Impact Document
CFR	Code of Federal Regulations
COEM	Conduct of Engineering Manual
CPM	Critical Path Method
CWA	Clean Water Act
CV	Cost Variance
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DOP	Decommissioning Operations Plan
EAC	Estimate At Completion
EDE	Effective Dose Equivalent
EPA	Environmental Protection Agency

EPCRA	Emergency Planning and Community Right to Know Act
EWP	Enhanced Work Planning
F	Fluorine
FSAR	Facility Safety Analysis Report
FY	Fiscal Year
GB	Glovebox
HF	Hydrofluoric Acid
HEPA	High Efficiency Particulate Air
HEUN	Highly Enriched Uranyl Nitrate
HPGe	Hyper-Pure Germanium
HVAC	Heating Ventilation and Air Conditioning
IHSS	Industrial Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
IMC	Integrating Management Contractor
ISB	Integrated Site Baseline
ISM	Integrated Safety Management
IWCP	Integrated Work Control Package
KOH	Potassium Hydroxide
LANL	Los Alamos National Laboratory
LCO	Limiting Condition of Operation
LDR	Land Disposal Requirement
LLW	Low-level Waste
LRA	Lead Regulatory Agency
m	meter
MBA	Material Balance Areas
mg	milligram
mm	millimeter
MOU	Memorandum Of Understanding
nCi	nanocuries
N_2	Nitrogen

NaOH	Sodium Hydroxide
NDA	Nondestructive Assay
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NTS	Nevada Test Site
O_2	Oxygen
ORR	Operational Readiness Review
OSHA	Occupational Safety & Health Administration
PCB	Polychlorinated Biphenyls
PMB	Performance Measurement Baseline
PMP	Project Management Plan
PPE	Personal Protective Equipment
PU&D	Property Utilization & Disposal
PUREX	Plutonium-Uranium Extraction facility at Hanford
Pu	Plutonium
QA	Quality Assurance
QAP	Quality Assurance Plan
QAPP	Quality Assurance Program Plan
RCM	Radiological Control Manual
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLCR	Reconnaissance Level Characterization Report
RMRS	Rocky Mountain Remediation Services, L L C
RTR	Real-Time Radiography
RWP	Radiological Work Permit
S&M	Surveillance and Maintenance
SHPO	State Historic Preservation Officer

Site	Rocky Flats Environmental Technology Site
SME	Subject Matter Expert
SNM	Special Nuclear Material
SSC	System, Structure, Component
SSOC	Safe Sites of Colorado, L L C
SV	Schedule Variance
TQM	Total Quality Management
TRU	Transuranic
TSCA	Toxic Substances Control Act
TSR	Technical Safety Requirement
UPS	Uninterruptible Power Supply
USQ	Unreviewed Safety Question
UST	Underground Storage Tank
WA	Work Authorization
WAC	Waste Acceptance Criteria
WAD	Work Authorization Document
WBS	Work Breakdown Structure
WIPP	Waste Isolation Pilot Plant
WMP	Waste Management Plan
WSP	Work Summary Plan

Appendix 3 Equipment Selection Criteria

Group A Physical Constraints

- Dedicated work space and accessibility
- Work space does not conflict with other operational activities
- Activities cannot disable needed utility and support systems
- Consideration should be given, for diversity sake, to deal with a variety of equipment/systems for future groups

Group B Workforce

- Workforce is trained and experienced to carry out the activities
- Organize activities to increase efficiency (production team) – consider similar type activities at same time
- ALARA must be considered, dose reduction achieved by equipment removal-balanced by available dose budget

Group C Operational / Technical Issues

- Consider removal of cold process systems with high potential for cross contamination
- Pick activities to accomplish major hazard reduction while ensuring a sufficient number of necessary "practice" activities
- Ensure closure and spare equipment available for activities chosen
- Consider life expectancy/recent failures

Group D: Management

- Choose activities with regulatory path forward (authorization basis, criticality evaluations, permits, etc)
- Consider activities that yield early successes and easy to measure metrics

Group E. Cost

- Excess materials (recycle) when there is an identified need
- Choose equipment/systems to eliminate high S&M costs

Group F Waste

- Little effort required to meet waste disposal criteria (WIPP, NTS, Envirocare/ Site/etc)
- Few different waste types involved with the activity
- Available, easy to accomplish size reduction and decontamination technologies need, location, costs

Appendix 4 771/774 Closure Project Equipment Sets by Priority

Priority	Set #	Set Description
1	37	Rm 181A Boxes, Vessels, & Piping
2	40	Rm 183 Storage Area
3	32	Rm 149 Unused Glovebox #30, vessels & piping
4	34	Rm 148 Process Area
5	44	Rm 179 Maintenance Area
6	38	Rm 182 Gloveboxes
7	45	Rm 174 Process Area
8	43	Rm 180A-F &K Process Area
9	42	Rm 180 Office Area
10	41	Rm 186 Process Area
11	36	Rm 146 Process Area
12	17	Rm 114 Process Room, GB#17
13	50	Rm 158 Lab Analysis
14	49	Rm 157 Stock Room Area
15	10	Rm 114 GB#5
16	3	Locker Room Area
17	35	Rm 147 Office Area
18	7	Rm 114 GB#2
19	14	Rm 114 GB #14
20	22	Rm 149 Incinerator GB #33,37,38,39
21	1	Corridor B Office Area
22	15	Rm 114 GB#13, Old #14
23	48	Rm 153 Process Area
24	27	Rm 149 Process Area old GB#30
25	8	Rm 114 GB #3

26	30	Rm 149 Process Area GB# 42
27	26	Rm 149 Process Area GB# 29
28	24	Rm 149 Process Area GB# 26
29	25	Rm 149 Process Area GB# 27 (Cold)
30	6	Rm 114 GB# 1
31	33	Rm 149 Process Area Tank Farm
32	9	Rm 114 GB# 4, 5A, 9A, 22
33	59	Indirect/Direct Evaporative Cooling Area
34	29	Rm 149 Process Area GB# 40, 44
35	2	Corridor F Office Area
36	39	Rm 182A gloveboxes
37	51	Rm 149 Utility Support Area
38	13	Rm 114 GB# 11, new 14
39	12	Rm 114 GB# 8, 8E, 9
40	16	Rm 114 GB# 15, 16
41	46	Rm 164 Lab Area
42	11	Rm 114 GB# 6, 7, 7A
43	4	Rm 129 Maintenance Area
44	28	Rm 149 Process Area GB# 31, 50
45	18	Rm 114 GB# 18
46	57	309 Tank Area
47	23	Rm 149 Process Area GB # 23, 24, 25
48	31	Rm 149 Process Area GB # 43A-43D
49	58	Corridor A, D, R, G, H, Stairwell #1-3, 127 Utility Rm
50	19	Elevator Area
51	56	Rm 249 HVAC Exhaust and Utilities Area
52	52	Rm 190 Deluge Process Area
53	5	Rm 141

54	20	Annex Area
55	21	Rm 149 Process Area C-Cell
56	53	Main Plenum Area
57	54	283 HVAC Exhaust & Utilities Area
58	55	235 HVAC Supply & Utilities Area
59	61	202 Process Area
60	62	241 Process Area
61	63	250 Storage Area
62	64	212 Storage Area
63	65	103 Process Area
64	66	102 Process Area
65	67	210 Process Area
66	68	200 Dock Area
67	69	203 Process Area
68	70	341 Utilities Area
69	71	441 Utilities Area
70	72	320 Utilities Area
71	73	200-300 Office Area
72	77	771/774 Out Buildings
73	79	Rm 114/114A Process Rooms
74	78	Rm 181A Size Reduction Area
75	80	Rm 183 Drum Counter
76	60	771 HVAC
77	74	774 HVAC
78	47	Rm 151 Radiation Control
79	76	771/774 Utilities
80	75	771/774 Cluster Facilities
81	81	771A Outbuildings

RCRA Units in Building 771 and Current Closure Status

Room No	RCRA Unit No	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
Bldg 771 Units					
181A	771 1 (Old Unit 90 23)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
182	771 1 (Old Unit 90 24)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
Annex	771 1 (Old Unit 90 25)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
186	771 1 (Old Unit 90 32)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
172	771 1 (Old Unit 90 64)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
184	771 1 (Old Unit 90 65)	Container Storage (Vault)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
146C	771 1 (Old Unit 90 83)	Container Storage (Vault)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
163	771 1 (Old Unit 90 115)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
164	771 1 (Old Unit 90 116)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180A	771 1 (Old Unit 90 117)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180E	771 1 (Old Unit 90 119)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180F	771 1 (Old Unit 90 120)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180K	771 1 (Old Unit 90 121)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
187	771 1 (Old Unit 90 122)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
183	771 1 (Old Unit 90 129)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180D	771 3	Hydroxide Precip (Treatment)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
149	90 21	Container Storage Area	none	MR Container Units Closure Plan	45-Day Notice
114	90 22	Container Storage Area	none	MR Container Units Closure Plan	45-Day Notice
180B	90 84	Container Storage (Vault)	none	MR Container Units Closure Plan	45-Day Notice
146	90 114	Container Storage Area	none	MR Container Units Closure Plan	45-Day Notice
146	90 114	Container Storage (GB)	none	MR Container Units Closure Plan	45-Day Notice
149	90 21	Container Storage (GB)	none	MR Container Units Closure Plan	45-Day Notice
114	90 22	Container Storage (GB)	none	MR Container Units Closure Plan	45-Day Notice
159	90 14	Container Storage (GB-4 only)	none	MR Container Units Closure Plan	45-Day Notice
149	771 3	Incinerator	none	need one	Closure Plan
114	53	Misc Cementation (Treatment)	none	need one	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No	RCRA Unit No	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
114	90 001	Tank D-500	none	need one	Closure Plan
114	93 002	Tank D-501	none	need one	Closure Plan
114	93 003	Tank D-502	none	need one	Closure Plan
114	93 004	Tank D-503	none	need one	Closure Plan
114	93 005	Tank D-504	none	need one	Closure Plan
114	93 006	Tank D-505	none	need one	Closure Plan
114	93 007	Tank D-506	none	need one	Closure Plan
114	93 008	Tank D-507	none	need one	Closure Plan
114	93 009	Tank D-508	none	need one	Closure Plan
114	93 010	Tank D-A	none	need one	Closure Plan
114	93 011	Tank D-B	none	need one	Closure Plan
114	93 012	Tank D-529	none	need one	Closure Plan
114	93 013	Tank D-530	none	need one	Closure Plan
114	93 014	Tank D-544	none	need one	Closure Plan
114	93 015	Tank D-545	none	need one	Closure Plan
114	93 016	Tank D-546	none	need one	Closure Plan
114	93 017	Tank D-547	none	need one	Closure Plan
114	93 018	Tank D-548	none	need one	Closure Plan
114	93 019	Tank D-549	none	need one	Closure Plan
114	93 020	Tank D-550	none	need one	Closure Plan
114	93 021	Tank D-551	none	need one	Closure Plan
114	93 022	Tank D-552	none	need one	Closure Plan
114	93 023	Tank D-553	none	need one	Closure Plan
114	93 024	Tank D-554	none	need one	Closure Plan
114	771 2	Tank D-609	none	need one	Closure Plan
114	771 2	Tank D-610	none	need one	Closure Plan
114	93 025	Tank D-705	none	need one	Closure Plan
114	93 026	Tank D-706	none	need one	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No	RCRA Unit No	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
114	93 027	Tank D-713	none	need one	Closure Plan
114	93 028	Tank D-714	none	need one	Closure Plan
114	771 2	Tank D-715	none	need one	Closure Plan
114	771 2	Tank D-716	none	need one	Closure Plan
114	771 2	Tank D-764	none	need one	Closure Plan
114	771 2	Tank D-765	none	need one	Closure Plan
114	93 029	Tank D-949	none	need one	Closure Plan
114	93 030	Tank D-951	none	need one	Closure Plan
114	93 031	Tank D-952	none	need one	Closure Plan
114	93 032	Tank D-953	none	need one	Closure Plan
114	93 033	Tank D-954	none	need one	Closure Plan
114	93 034	Tank D-955	none	need one	Closure Plan
146	93 035	Tank D-1001	none	need one	Closure Plan
146	93 036	Tank D-1002	none	need one	Closure Plan
146	93 037	Tank D-1003	none	need one	Closure Plan
146	93 038	Tank D-1004	none	need one	Closure Plan
146	93 039	Tank D-1005	none	need one	Closure Plan
146	93 040	Tank D-1006	none	need one	Closure Plan
146	93 041	Tank D-1007	none	need one	Closure Plan
146	93 042	Tank D-1008	none	need one	Closure Plan
146	93 043	Tank D-1009	none	need one	Closure Plan
146	93 044	Tank D-1010	none	need one	Closure Plan
146	93 045	Tank D-1011	none	need one	Closure Plan
146	93 046	Tank D-1012	none	need one	Closure Plan
146	93 047	Tank D-1013	none	need one	Closure Plan
146	771 2	Tank D-1019	none	need one	Closure Plan
146	771 2	Tank D-1020	none	need one	Closure Plan
146	93 048	Tank D-1022	none	need one	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No	RCRA Unit No	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
146	771 2	Tank D-1023	none	need one	Closure Plan
146	771 2	Tank D-1024	none	need one	Closure Plan
146	93 049	Tank D-1032	none	need one	Closure Plan
146	93 050	Tank D-1014	none	need one	Closure Plan
146	771 2	Tank D-1062	none	need one	Closure Plan
146	771 2	Tank D-1063	none	need one	Closure Plan
146	771 2	Tank D-1064	none	need one	Closure Plan
146	93 051	Tank D-1065	none	need one	Closure Plan
146	93 052	Tank D-1066	none	need one	Closure Plan
149	771 2	Tank D-177	none	need one	Closure Plan
149	771 2	Tank D-203	none	need one	Closure Plan
149	771 2	Tank D-204	none	need one	Closure Plan
149	771 2	Tank D-205	none	need one	Closure Plan
149	771 2	Tank D-206	none	need one	Closure Plan
149	771 2	Tank D-207	none	need one	Closure Plan
149	93 089	Tank D-208	none	need one	Closure Plan
149	771 2	Tank D-218	none	need one	Closure Plan
149	771 2	Tank D-219	none	need one	Closure Plan
149	93 090	Tank D-360	none	need one	Closure Plan
149	93 091	Tank D-361	none	need one	Closure Plan
149	93 092	Tank D-362	none	need one	Closure Plan
149	93 093	Tank D-363	none	need one	Closure Plan
149	93 094	Tank D-364	none	need one	Closure Plan
149	93 095	Tank D-451	none	need one	Closure Plan
149	93 096	Tank D-452	none	need one	Closure Plan
149	93 097	Tank D-453	none	need one	Closure Plan
149	93 098	Tank D-454	none	need one	Closure Plan
149	93 099	Tank D-466	none	need one	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No	RCRA Unit No.	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
149	93 100	Tank D-467	none	need one	Closure Plan
149	93 101	Tank D-468	none	need one	Closure Plan
149	93 102	Tank D-469	none	need one	Closure Plan
149	93 103	Tank D-470	none	need one	Closure Plan
149	93 104	Tank D-472	none	need one	Closure Plan
149	771 2	Tank D-630	none	need one	Closure Plan
149	771 2	Tank D-631	none	need one	Closure Plan
149	93 105	Tank D-921	none	need one	Closure Plan
149	93 106	Tank D-922	none	need one	Closure Plan
149	93 107	Tank D-923	none	need one	Closure Plan
149	93 108	Tank D-927	none	need one	Closure Plan
149	93 109	Tank D-928	none	need one	Closure Plan
149	93 110	Tank D-931	none	need one	Closure Plan
149	93 111	Tank D-932	none	need one	Closure Plan
149	93 112	Tank D-933	none	need one	Closure Plan
149	93 113	Tank D-934	none	need one	Closure Plan
149	93 114	Tank D-971	none	need one	Closure Plan
149	93 115	Tank D-972	none	need one	Closure Plan
149	93 116	Tank D-973	none	need one	Closure Plan
149	93 117	Tank D-974	none	need one	Closure Plan
149	93 118	Tank D-975	none	need one	Closure Plan
149	93 119	Tank D-976	none	need one	Closure Plan
149	93 120	Tank D-980	none	need one	Closure Plan
174	93 121	Tank D-1081	none	need one	Closure Plan
174	93 122	Tank D-1082	none	need one	Closure Plan
174	93 123	Tank D-1083	none	need one	Closure Plan
174	771 2	Tank D-1084	none	need one	Closure Plan
174	93 124	Tank D-1087	none	need one	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No.	RCRA Unit No.	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
174	93 125	Tank D-1088	none	need one	Closure Plan
180A	93 126	Tank D-1803	none	need one	Closure Plan
180A	93 127	Tank D-1804	none	need one	Closure Plan
180A	93 128	Tank D-1805	none	need one	Closure Plan
180	93 129	Tank D-1809	none	need one	Closure Plan
180A	93 130	Tank D-1810	none	need one	Closure Plan
180A	93 131	Tank D-1811	none	need one	Closure Plan
180A	93 132	Tank D-1813	none	need one	Closure Plan
180A	93 133	Tank D-1816	none	need one	Closure Plan
180A	93 134	Tank D-1817	none	need one	Closure Plan
180A	93 135	Tank D-1818	none	need one	Closure Plan
180A	93 136	Tank D-1819	none	need one	Closure Plan
180K	93 137	Tank D-83	none	need one	Closure Plan
180K	93 138	Tank D-84	none	need one	Closure Plan
180K	93 139	Tank D-85	none	need one	Closure Plan
181A	93 140	Tank D-1401	none	need one	Closure Plan
181A	93 141	Tank D-1402	none	need one	Closure Plan
181A	93 142	Tank D-1406	none	need one	Closure Plan
181A	93 143	Tank D-1407	none	need one	Closure Plan
181A	93 144	Tank D-1409	none	need one	Closure Plan
181A	93 145	Tank D-1410	none	need one	Closure Plan
181A	93 146	Tank D-1411	none	need one	Closure Plan
180K	93 149	Tank D-80	none	need one	Closure Plan
180K	93 150	Tank D-81	none	need one	Closure Plan
180K	93 151	Tank D-82	none	need one	Closure Plan
114	93 152	Tank D-950	none	need one	Closure Plan
153	771 2	Tank D-86	none	need one	Closure Plan
153	771 2	Tank D-87	none	need one	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No	RCRA Unit No	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
153	771 2	Tank D-88	none	need one	Closure Plan
153	771 2	Tank D-3	none	need one	Closure Plan
153	771 2	Tank D-4	none	need one	Closure Plan

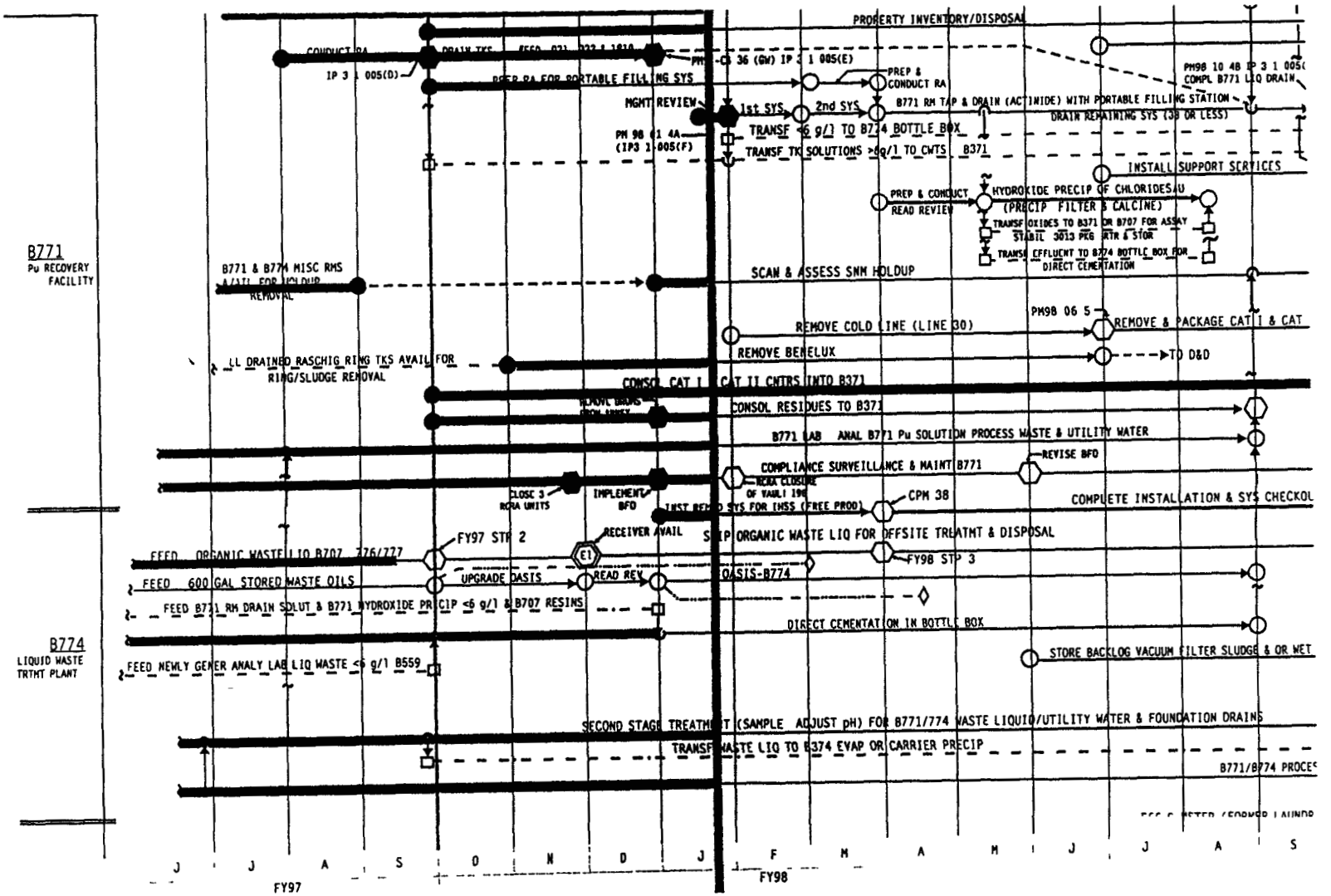
RCRA Units in Building 774 and Current Closure Status

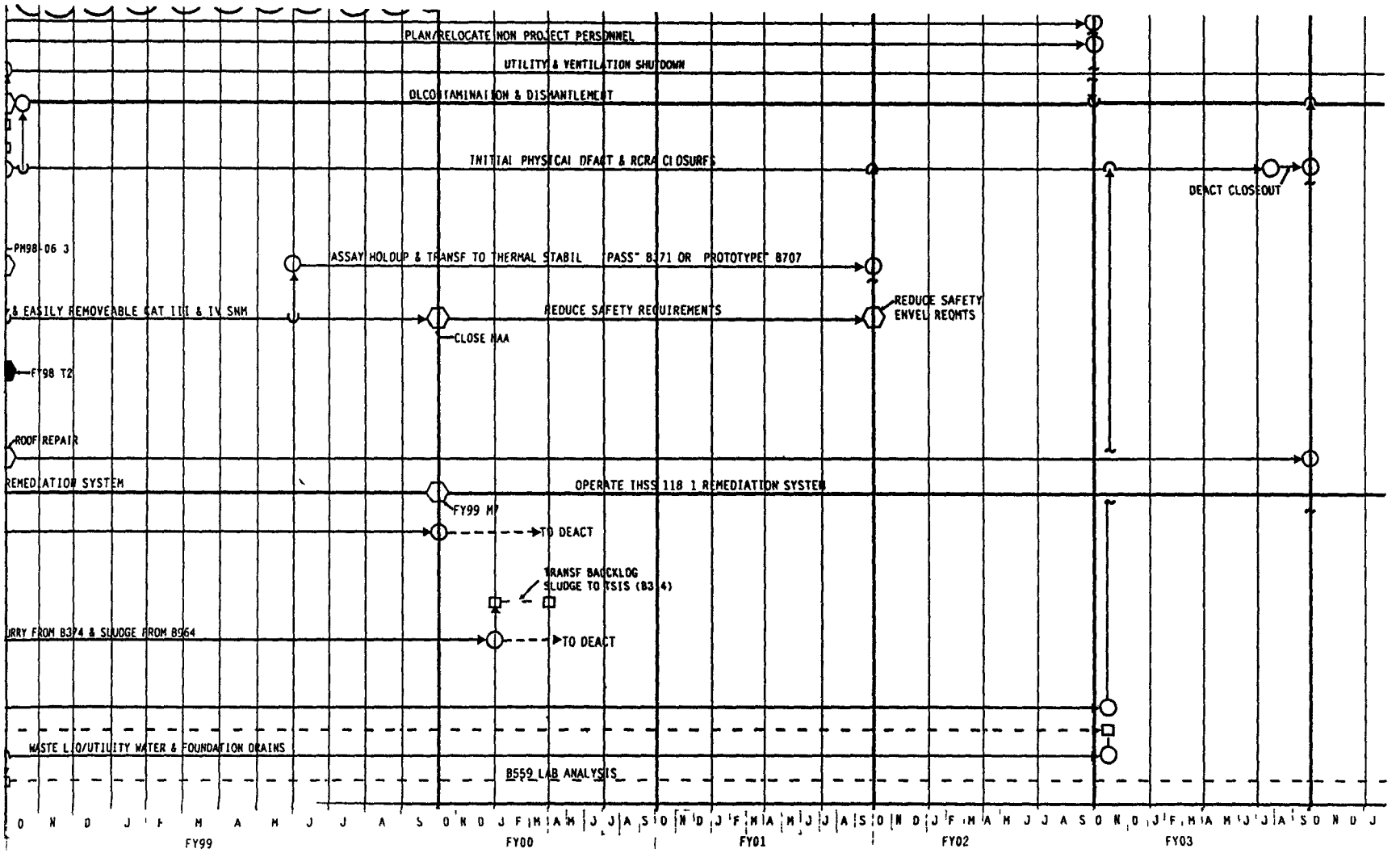
Room No	RCRA Unit No	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
Bldg 774 Units					
241	774 1	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
210	774 3A	Misc Waste Solidification(Trtmt)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
103	774 3B	Tank T-40	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
241	774 3B	Tank 201	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
241	774 3B	Tank 202	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
241	774 3B	Tank 203	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
241	774 3B	Tank 204	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
220	774 2	Tank T-102	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
220	774 2	Tank T-103	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
202	55 01	Tank T-1A	Interim Status	I S Closure Plan pending	Closure Description Document
202	55 02	Tank T-1RF	Interim Status	I S Closure Plan pending	Closure Description Document
202	55 03	Tank T-4L	Interim Status	I S Closure Plan pending	Closure Description Document
102	55 04	Tank T-10	Interim Status	I S. Closure Plan pending	Closure Description Document
202	55 05	Tank T-4R	Interim Status	I S Closure Plan pending	Closure Description Document
202	55 07	Tank T-70	Interim Status	I S Closure Plan pending	Closure Description Document
102	55 08	Tank F-5	Interim Status	I' S Closure Plan pending	Closure Description Document
102	55 09	Tank C-1	Interim Status	I S Closure Plan pending	Closure Description Document
102	55 10	Tank T-9	Interim Status	I S Closure Plan pending	Closure Description Document
202	55 11	Tank T-2F	Interim Status	I S Closure Plan pending	Closure Description Document
102	55 12	Tank T-12F	Interim Status	I S Closure Plan pending	Closure Description Document
202	55 22	Vacuum Filter B (Treatment)	Interim Status	I S Closure Plan pending	Closure Description Document
202	55 23	Tank T-73B	Interim Status	I S Closure Plan pending	Closure Description Document
102	55 24	Tank T-210A	Interim Status	I S Closure Plan pending	Closure Description Document
202	55 25	Tank T-71	Interim Status	I S Closure Plan pending	Closure Description Document
103	55 27	Tank 40	Interim Status	I S Closure Plan pending	Closure Description Document
210	56 01	Tank T-1 Waste Oil Tank	Interim Status	I S Closure Plan pending	Closure Description Document
210	56 02	Tank T-2 Waste Oil Tank	Interim Status	I S Closure Plan pending	Closure Description Document
210A	56 03	Tank T-13 Waste Oil Tank	Interim Status	I S Closure Plan pending	Closure Description Document
210A	56 04	Tank T-14 Waste Oil Tank	Interim Status	I S Closure Plan pending	Closure Description Document
210	56 05	OASIS Glovebox Mixer (Trtmt)	Interim Status	I S Closure Plan pending	Closure Description Document
210	56 07	Tank T-374A Waste Oil Tank	Interim Status	I S Closure Plan pending	Closure Description Document

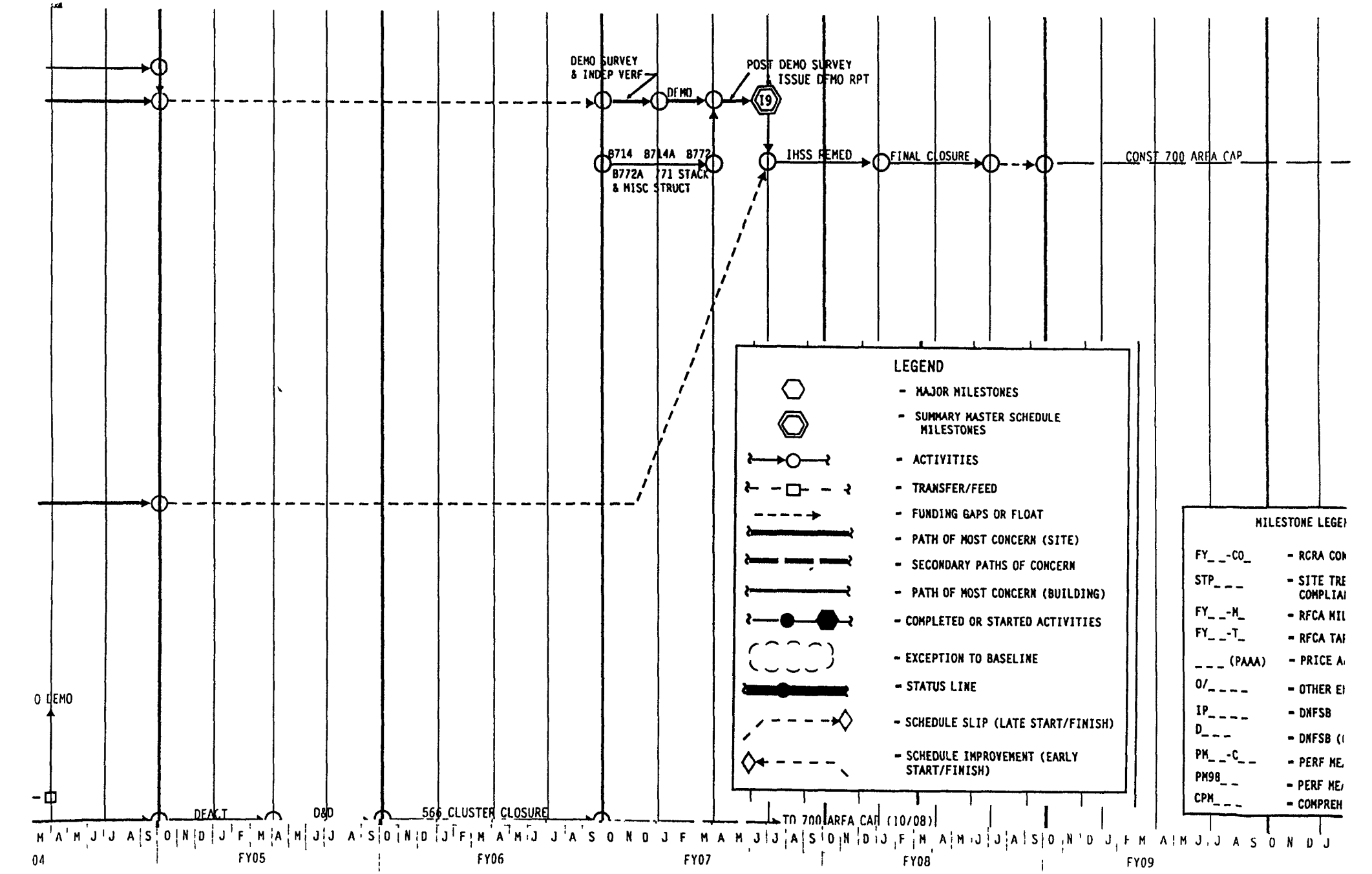
RCRA Units in Building 774 and Current Closure Status

Room No	RCRA Unit No	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
UST	55 13 (also IHSS 215)	Old Tank T-40	Interim Status	I S Closure Plan pending	RFCA Decision Document?*
UST	55 14 (also IHSS 124 2)	Tank T-66	Interim Status	I S Closure Plan pending	RFCA Decision Document?*
UST	55 15 (Also IHSS 124 3)	Tank T-67	Interim Status	I S Closure Plan pending	RFCA Decision Document?*
UST	55 16 (also IHSS 124 1)	Tank T-68	Interim Status	I S Closure Plan pending	RFCA Decision Document?*

* RFCA Decision Document may or may not be necessary, since tanks were drained and filled with foam


B771
Pu RECOVERY FACILITY
B774
LIQUID WASTE TRTMT PLANT
PROPERTY INVENTORY/DISPOSAL
PREP & CONDUCT RA
B771 RM TAP & DRAIN (ACTINIDE) WITH PORTABLE FILLING STATION
DRAIN REMAINING SYS (3g OR LESS)
MGMT REVIEW
1st SYS
2nd SYS
TRANSF <6 g/l TO B774 BOTTLE BOX
TRANSF TK SOLUTIONS >6g/l TO CWTS B371
INSTALL SUPPORT SERVICES
PREP & CONDUCT READ REVIEW
HYDROXIDE PRECIP OF CHLORIDES (PRECIP FILTER & CALCINE)
TRANSF OXIDES TO B371 OR B707 FOR ASSAY
STABIL 3013 PKG RTR & STOR
TRANSF EFFLUENT TO B774 BOTTLE BOX FOR DIRECT CEMENTATION
B771 & B774 MISC RMS
SCAN & ASSESS SNM HOLDUP
REMOVAL
REMOVE COLD LINE (LINE 30)
REMOVE & PACKAGE CAT I & CAT
REMOVE BENELUX
TO D&D
LL DRAINED RASCHIG RING TKS AVAIL FOR RING/SLUDGE REMOVAL
CONSOL CAT I & CAT II CNTRS INTO B371
CONSOL RESIDUES TO B371
B771 LAB ANAL B771 Pu SOLUTION PROCESS WASTE & UTILITY WATER
REVISE BFD
COMPLIANCE SURVEILLANCE & MAINT B771
CLOSE 3 RCRA UNITS
IMPLEMENT BFD
CPM 38
COMPLETE INSTALLATION & SYS CHECKOL
FY97 STP 2
RECEIVER AVAIL
E1
STP ORGANIC WASTE LIQ FOR OFFSITE TREATMT & DISPOSAL
FEED ORGANIC WASTE LIQ B707 776/777
FY98 STP 3
FEED 600 GAL STORED WASTE OILS
UPGRADE OASIS
READ REV
OASIS-B774
FEED B771 RM DRAIN SOLUT & B771 HYDROXIDE PRECIP <6 g/l & B707 RESINS
DIRECT CEMENTATION IN BOTTLE BOX
FEED NEWLY GENER ANALY LAB LIQ WASTE <6 g/l B559
STORE BACKLOG VACUUM FILTER SLUDGE & OR WET
SECOND STAGE TREATMENT (SAMPLE ADJUST pH) FOR B771/774 WASTE LIQUID/UTILITY WATER & FOUNDATION DRAINS
TRANSF WASTE LIQ TO B374 EVAP OR CARRIER PRECIP
B771/B774 PROCES
J J A S O N D J F M A M J J A S
FY97
FY98


PLAN/RELOCATE NON PROJECT PERSONNEL
UTILITY & VENTILATION SHUTDOWN
DECONTAMINATION & DISMANTLEMENT
INITIAL PHYSICAL DEACT & RCRA CLOSURES
DEACT CLOSEOUT
PM98-06 3
ASSAY HOLDUP & TRANSF TO THERMAL STABIL "PASS" B371 OR PROTOTYPE B707
& EASILY REMOVEABLE CAT III & IV SNM
REDUCE SAFETY REQUIREMENTS
REDUCE SAFETY ENVEL REQMTS
CLOSE MAA
FY98 T2
ROOF REPAIR
REMEDIATION SYSTEM
OPERATE IHSS 118 1 REMEDIATION SYSTEM
FY99 M7
TO DEACT
TRANSF BACKLOG SLUDGE TO TSIS (B3 4)
URRY FROM B374 & SLUDGE FROM B964
TO DEACT
WASTE LIQ/UTILITY WATER & FOUNDATION DRAINS
B559 LAB ANALYSIS
O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J
FY99
FY00
FY01
FY02
FY03


DEMO SURVEY
& INDEP VERF
DEMO
POST DEMO SURVEY
& ISSUE DEMO RPT
I9
B714 B714A B772
B772A 771 STACK
& MISC STRUCT
IHSS REMED
FINAL CLOSURE
CONST 700 AREA CAP
LEGEND
- MAJOR MILESTONES
- SUMMARY MASTER SCHEDULE MILESTONES
- ACTIVITIES
- TRANSFER/FEED
- FUNDING GAPS OR FLOAT
- PATH OF MOST CONCERN (SITE)
- SECONDARY PATHS OF CONCERN
- PATH OF MOST CONCERN (BUILDING)
- COMPLETED OR STARTED ACTIVITIES
- EXCEPTION TO BASELINE
- STATUS LINE
- SCHEDULE SLIP (LATE START/FINISH)
- SCHEDULE IMPROVEMENT (EARLY START/FINISH)
MILESTONE LEGE
FY__-CO_ - RCRA CO
STP___ - SITE TRE COMPLIA
FY__-M_ - RFCA MI
FY__-T_ - RFCA TA
___(PAAA) - PRICE A
O/____ - OTHER E
IP____ - DNFSB
D___ - DNFSB (
PM__-C__ - PERF ME
PM98__ - PERF ME
CPM___ - COMPREH
O DEMO
DEACT
D&D
566 CLUSTER CLOSURE
TO 700 AREA CAP (10/08)
M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J
04
FY05
FY06
FY07
FY08
FY09

Appendix 7 Comments and Comment Disposition Summary